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# Should Medical Administrative Officers Be Certified? A 1938 Fantasy*

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Most persons would probably agree that one of the principal characteristics which distinguish the behavior of man from that of the other animals which share this planet with him is his tendency to restrict his activities to special fields of endeavor in order to gain a livelihood and improve his lot here below. While it is true that some of the insects which have formed the habit of living together in communities also exhibit this tendency toward specialization of function, in no other animal species has the proclivity developed to the extent that it has in man.

The natural result of this tendency to specialization has been first the formation of occupational groups, followed by the setting up of standards for admission to the group and, finally, the public certification of those who have met the requirements and have been admitted. The process is familiar to everyone, for it has repeated itself in calling after calling, ranging all the way from that of beauty specialist, on the one hand, to the learned professions, on the other. The later steps in this process often come to be regarded as functions of government, in which case they are fortified by legislation and may be subject to some of the difficulties which seem to be inherent in the conduct of governmental affairs. A by-product of this activity is the formation of associations, one for each group. The members of these associations foregather annually, indulge in much talk and then sometimes, I fear, like Omar Khayyam, come out by the same door wherein they went.

Now the process of division into occupational groups does not always stop at the formation of the primary group. By and by, there may come specialization within that group, so that new and smaller groups are formed, which, in turn, set up their own standards of admission and their own methods of certification. We have but recently seen this process of subdivision within the larger group come to full flower in American medicine with the formation of the American specialty boards.

The movement toward the formation of these boards began as long ago as

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1916 with the ophthalmologists, but it was a little slow in gathering headway at first, and it was not until after 1930 that it attained its greatest momentum. It received the approval of the American Medical Association and of our own body, spread to all of the major clinical specialties, and also entered one of the preclinical fields, that of pathology. The only major medical disciplines which have not thus far swung into line are anatomy, physiology, biological chemistry, pharmacology and bacteriology. Perhaps that is because their devotees do not enter directly into the business of providing medical care to the public and, therefore, do not feel that they need to be regulated in the interest of the public.

Now there is one other branch of medicine which has not thus far allied itself with this movement, and, since at least some of the activities of the members of that branch come within the purview of this Association, I feel justified in bringing the matter to your attention. In fact, if I did not do so, I should feel that I had been derelict in my duty, and that I had betrayed the trust which you have so kindly reposed in me.

The branch of medicine to which I refer is that represented by the administrative officers of medicine, the deans of medical schools and the directors and superintendents of hospitals. In this group are found the men who entered medical schools so many years ago with the high hope and expectation that they would one day take their places in the ranks of those who minister directly to the ills of their fellow men and who, alas, have in so many instances been doomed to a life of frustration—at least in the eyes of some of their friends and colleagues. It is scarcely to be denied that some of the members of this group have had to forego some of their fondest hopes. For many of them there is no longer the prospect of high clinical or scientific adventure. If, as in their early days, they still dream, at times, that they, too, might one day perform an operation in a crowded amphitheatre, before tier on tier of distinguished visiting surgeons, and, by their mastery of the manipulative art, assure to the patient at least life, if not liberty or the capacity to pursue happiness, they must resolutely put that vision behind them and come back to the every day reality of writing recommendations for none-too-bright students and answering innumerable foolish questionnaires. They may not even aspire to visit some humble cottage and watch beside the bed of a sick child while distracted parents, standing in the shadow beyond the lamp light, await anxiously the word as to whether it is—measles or chicken pox. No, such a destiny is not for them, I fear.

Their destiny is to wrestle with budgets and bills, to try and make one dollar do the work of two, to soothe the ruffled sensibilities of department heads, on the one hand, or of nurses' training school heads on the other, to face parents whose sons or daughters have not proved to be the eminent scholars their devoted parents believed them to be, to deal with the complaints of purse proud patients who consider that they have not had the kind of attention to which they are entitled because of their special position in their own home town, and to greet returning alumni who are convinced that the school is going to the dogs and send those alumni home calmed and convinced of the error of their opinion. It

is not for these administrators to consider such sublime things as the saving of life. They must rest content with saving coal and electricity—they have to deal with money and other such sordid things.

I do not wish it to be supposed that what I have just said is intended to be a defense of the occupation of administrator, for I am quite sure that the members of this audience will agree with me that as an occupation administration needs no defense. Indeed, even the most lordly and independent department heads have been known to admit to their cronies, in unguarded moments, that administrators have their uses, even if they function at a different intellectual level, meaning by that, of course, at a level definitely below their own.

Nor is my statement to be taken either as a lament, or as the outward manifestation of a welling up, from the subconscious, of long suppressed desires. No indeed, it is no Freudian reaction, I assure you. Rather is it a crude attempt at job analysis in order to prepare the way for the question which forms the title of this communication—should medical administrative officers be certified?

Perhaps I ought to put that question a little more elegantly, somewhat as follows: Has not the time come to recognize in a dignified way that great body of workers in the medical field who conduct the business of medical institutions and who, whether they be deans of medical schools or superintendents of hospitals, also serve by only standing and waiting—upon others? Should not medical administration be recognized formally as one of the special branches of medicine and as a suitable field for the certification of specialists? If so, is it not desirable to set up an American Board of Medical Administration which shall have for its purpose the certification of the competency of deans of medical schools and directors and/or superintendents of hospitals? Nay more, is not such a step imperative in the interests of the public? Should not the people be protected against incompetent deanery and muddle headed hospital superintendency? How can trustees of universities and hospitals protect themselves against hiring poor medical deans or poor hospital superintendents if there is not some sort of certification of such functionaries? How can they be certain who are competent administrators and who are not? Certification of competency by a National Board of Medical Administration would conceivably relieve the trustees of hospitals and medical schools of the necessity of inquiring closely concerning those who were being considered for the post of superintendent and/or dean. All that they would have to do would be to stick a hat pin through the certified list from the reverse side and take the name that came nearest to the puncture, a procedure said to be useful in picking winners at the race track.

Lastly, would not the formulation of rigid requirements for qualifying before such a board lead to the better preparation of hospital superintendents and medical deans for their careers? Would it not be possible, if such a board were formed, to envisage, in the years to come, such an elevation of the practice of deaning and hospital superintending as could only be compared to the advance in the practice of surgery which was made possible through the discovery of the

relation of bacteria to infection? Who can calculate the good which would flow from the step which I have suggested? Who, indeed?

Before deciding to embark on such an enterprise, however, let us see, if only for our own amusement, how the specialty board idea, applied to our administrative selves, would work out in practice. In this connection we need to ask three questions: What steps are necessary to put the plan into operation? What is it likely to cost? Will it fulfill the purpose for which it was intended? For us bred-in-the-bone administrators such questions are of the nature of conditioned reflexes.

Let us first consider the successive steps which must be taken to make the enterprise a going concern. These have already been worked out for the other medical specialties and are clearly set forth in the official booklet issued by the Advisory Board for Medical Specialties.[1] Our task, then, is greatly simplified. It consists in seeing how closely the procedure worked out for the other medical specialties may be adapted to our own group.

From that booklet we learn that in the formation of specialty boards there are four main principles to be followed. These are stated as follows:

"1. A special examining board to be approved by the Advisory Board for Medical Specialties should represent a recognized and distinct specialty of medicine.

2. It should be composed of representatives of the national organizations in that specialty including the related section of the American Medical Association.

3. It should be incorporated.

4. A special board should:
   (a) Determine whether candidates have received adequate preparation.
   (b) Provide a comprehensive test of the ability and fitness of such candidates.
   (c) Certify to the competence of those physicians who have satisfied its requirements."

There should certainly be no difficulty in applying these principles to the formation of a new board dealing with administration. In actual practice it would be necessary, first, to secure the adherence of a sufficiently large number of deans of medical schools and superintendents of hospitals to ensure the approval of this association and also the approval of the three national hospital associations (American, Catholic, Protestant). Signing up a sufficient number of deans and hospital superintendents in advance might not prove to be so easy, for such fellows are notoriously skeptical of anything that is going to cost them money, but if they were given an opportunity to come in on the ground floor at the start, at a reduced rate, and without an examination, that is to say, no ques-

1. Fourth edition, 1937.

tions asked, it should be possible to fetch a considerable number of doubting Thomases. If any still refused to join in spite of this inducement, they could simply be dismissed as backward-lookers, captious critics and enemies of progress.

Once the approval of the associations I have mentioned was obtained, the promoters of the proposed Board of Medical Administration could then organize and incorporate, but before taking this final step of incorporation it would be desirable for them to approach the Advisory Board for Medical Specialties with a request for that Board's approval, accompanying the request with a list of the qualifications to be demanded of applicants for admission to the examination which must precede certification, whether as a dean or as a hospital administrator. What would those qualifications be? Again turning to the booklet, and taking the qualifications that have been formulated for the clinical specialties and adapting them as nearly as may be to the specialty of administration, bearing in mind that not all medical administrators are doctors of medicine, we then have a list somewhat along the following lines:

A. General Qualifications:
   1. Satisfactory moral and ethical standing in the profession.
   2. Membership in the American Medical Association, if the applicant has the M.D. degree.

B. Professional Standing:
   1. Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from any high school or business college.
   2. Completion of an internship of not less than one year in a hospital approved by the same Council, if the candidate has an M.D. degree.

C. Special Training:
   1. A period of study of not less than three years in clinics, hospitals, dispensaries, laboratories, power plants, machine shops, plumbing shops, laundries, accounting offices and schools of business administration recognized as competent to provide a satisfactory training in their respective fields.
   2. This period of specialized training should include:
      (a) Graduate training in finance, accounting, personnel management, business administration, architecture, building construction, building maintenance, animal husbandry, gardening, medical economics, public speaking, letter writing, social etiquette and the other basic sciences which are necessary to the proper understanding of medical administration.
      (b) Examinations in the basic sciences of medical administration as well as in its practical aspects.
   3. An additional period of not less than two years of study and/or practice.

With that list of qualifications it should be possible successfully to run the gauntlet of the Advisory Board for Medical Specialties.

We come now to the question of cost. The enterprise must be made self-sustaining and in all probability it will be so, once it gets going. It would be expected to subsist on the fees from those who seek to be certified. If the undertaking is limited exclusively to deans and assistant deans of medical schools, it would, of course, die of inanition, but by including hospital superintendents and assistant superintendents within the scope of the enterprise, the potential sources of revenue would be greatly increased. The number of medical administrators that would become eligible for certification each year on that basis has not as yet been determined but it must be fairly large. If, following the procedure adopted by some of the specialty boards already in existence, a fee of $10.00 were charged during the initial period of organization, and if that fee were increased to $50.00 after the enterprise got on its feet, my guess is that it would thereafter be self-sustaining. Perhaps some philanthropic organization would be willing to help it over the difficult period of infancy.

We come now to the final question. Would the undertaking fulfill the primary purpose for which it had been designed; that is, would it protect the public against incompetent medical administrators? At this point I must confess to a horrible doubt. There seems to me to be a fly or two in this beautiful ointment that we have been compounding, and candor, as well as conscience, compels me to call your attention to them.

One of these flies is this: Certification is intended to convey the idea of proper preparation and also of competency within a given field of practical endeavor, but competency in the practice of any branch of medicine, administration included, does not rest solely on proper preparation, important as that may be, or even on the mastery of intricate technical procedures. Far more does it rest on wide experience and sound judgment, and I find it difficult to believe that any formal system of evaluation will throw much light on the presence or absence of good judgment.

The other fly seems to me to be this: A certificate intended to attest to competency begins to lose its value, so far as competency is concerned, immediately after the act of validation is completed. In that connection, strictly speaking, it can only be taken at full face value at the date of issue, and in time it may become altogether misleading. It merely states that a given status obtained at a given time but it cannot be accepted as a warrant of the continuation of that status. This is a melancholy fact to face, that a certificate attesting to the competency of a dean might not always be taken at 100 per cent of its face value, but I am sure that you will face it with all of the fortitude that we like to think is characteristic of the members of the administrative craft.

"Cannot this difficulty be overcome, this last fly, at least, plucked from the ointment jar?" some of you may ask, in desperation. Conceivably it could, but at a price beyond that which even we administrators would, I fear, be willing to pay. The difficulty could be overcome by requiring those of us who have been

certified to come up for examination and certification at regular and not too long intervals thereafter, but would we administrators be willing to submit to examination by an outside board at intervals of, say, three or five years, to determine our competency, even if our living depended on it? Would our clinical brethren be willing to do likewise? With all due respect to those splendid brothers of ours in the clinical branches, I doubt that they are made of any sterner stuff than ourselves.

And so I come a little sadly to the conclusion that I cannot recommend to this Association that it go in for the certification of medical administrators; a little sadly because the prospect, at first glance, seemed not unfair. On closer examination, however, some defects were revealed and because of these I feel constrained to say that if you are still interested in the idea and wish to pursue it, I am afraid you will have to go to others for your support.

Before abandoning the subject, however, I feel that I must apologize to you medical administrative officers for so cruelly raising your hopes and then dashing them to the ground almost in the same breath. Such reprehensible conduct on the part of your presiding officer demands not only an apology but an explanation as well, and there really is an explanation and a reason for all this foolishness in which I have been indulging. The reason is that I wish to present for your serious consideration a suggestion which relates to the general problem of the protection of the public against incompetent medical care, about which we hear so much nowadays.

I suppose that nobody will deny that the public should be protected against incompetent medical practice, but the real question is, how is this protection to be obtained? The careful selection of our student body in the first instance, the diplomas granted by the medical schools, the licenses to practice granted by the state boards, the certificates issued by the specialty boards, all contribute to this end, but they are all of limited value, in my opinion, because they represent judgments rendered at a given time and it is impossible in the nature of things to require doctors to submit to formal judgments, including examinations, at stated intervals for the remainder of their professional lives.

Does this mean that the public has no other safeguard against incompetent medical practice after the last license or certificate has been granted? I think not. It seems to me that there is one other safeguard that has not been stressed sufficiently and to which attention should be drawn in this connection. I cannot escape the conclusion that the most effective protection of the public against incompetent medical practice in general, and against incompetent specialists in particular lies in the proper organization of our hospitals and the proper control of appointments to their staffs. If the hospital staffs, that is to say the doctors who practice in our hospitals, are organized on the basis of individual services, with responsible chiefs at the heads of those services who are resolute men and who will not hesitate to refuse to recommend for appointment or reappointment on their staffs, doctors who are unable or unwilling to play the medical game as it should be played, the public will not need to become greatly exercised over

the question of incompetency in medical practice. Continued membership on the staff of a hospital where appointments and reappointments are carefully scrutinized each year by the head of the service will be a cachet of competency, and will have the virtue of being at least a recent endorsement, instead of one ten, or twenty, or thirty years old. Admittedly the careful control of hospital appointments is no complete solution of the problem of protecting the public against incompetent medical practice, for there is no one complete solution, but it will go a long way in that direction. After all, the large majority of the major ailments for which something can be done are most likely to require the hospital for either diagnosis, or treatment, or both, and as for the specialists, not many of them can get very far without a hospital in which to carry on their work. The hospitals have a real responsibility in this matter, it seems to me, and they should endeavor to live up to it.

"But," the public will say, "this may all be very well as far as the specialists go, but how can we find out who are the reliable general practitioners, the good family doctors in our city, who may not have hospital appointments?" My answer to that would be: Ask the chiefs of the hospital services who they consider to be the good general practitioners in a community. These men are in a position to give worth while recommendations for they have been the consultants of the general practitioners and they know which ones are careful and intelligent and which ones are not. If they are too busy or, perhaps, unwilling to assume the responsibility, for personal reasons, then the public may turn to the administrative officers of the hospitals or to the responsible officers of the local medical society.

It seems to me that the contemporary opinion of one's own colleagues, with whom one works from day to day, offers the best possible appraisal of a professional man's competency, and, what is by no means unimportant to the patient, of his unselfishness. Surely we professional men, whether we be general practitioners, specialists, or even poor benighted administrators, value the good opinion of our daily companions of the craft more than any other thing. Why should not the general public be taught to value that opinion, too, as highly as we do, and how to obtain it? And, finally, is there so much incompetency in medical practice in America, as some would have us believe? What we need in regard to that question, it seems to me, is more specific information and fewer unsupported generalizations.

# Future of Public Health in the United States*

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The future of public health in any country depends on two variables: first, the future status of scientific knowledge of disease control; and, second, what is of even more importance, the future social concepts of which public health action is an integral part.

The bulk of the important scientific research in medicine and public health is being carried on in the medical schools. You know better than I what are likely to be the next great scientific discoveries giving us added power to control disease. Some of them now may be ready for announcement, will be followed promptly by confirmatory studies and, thereafter, by mass application. Yet none of us can forecast accurately the changes in medical and health practice which will come as a result of added scientific knowledge. We can be sure that there will be additions, and history shows that whenever we secure effective means for the prevention or control of disease, sooner or later the mass application of the scientific principle becomes a next step in public health action.

Similarly, changes in our social concepts, which may take place in the future, are not accurately predictable. It seems preferable, therefore, in a discussion of the future of public health to base it solely on current scientific knowledge and the prevailing concepts of governmental and social responsibility.

All of us are aware that there has been and continues to be a lag between scientific discoveries in medicine and their application on a large scale to improve the health of the people. Undoubtedly, one reason for the wasteful interval between knowing and doing lies in the fact that the great contributions of medical science to public health have come in our own time. People, in general, have become aware of them slowly. Doctors themselves have been skeptical, especially those whose medical education preceded the scientific acceptance of such discoveries or those who have had little, if any, direct contact with the leaders of clinical medicine. There has been little popular pressure for public health action, even as its benefits became better understood. For until very recently, public health work has been confused in the people's minds with philanthropy and charity. It has been thought to have much in common with charitable gratuities which we bestow on the unfortunate when there is a surplus in the personal or the public budget. Only in war time were health services considered to carry a public interest and then only as they affected the fighting forces and the population which fed and munitioned them.

Those of you who have had considerable contact with popular sentiment will agree, I think, that there has been a tremendous change in the old attitude of indifference to public health. We are beginning to feel the cumulative impact

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of two decades of desultory but widespread health education—in the schools, in periodicals, in the civic and cultural organizations, stemming out of the health and welfare activities of the voluntary agencies, in the institutional promotion of the great life insurance companies and some of the pharmaceutical houses, and in connection with organized medical groups and official health department programs. The principles of child care, for example, have become folk lore among American families of middle class and better. Over-the-fence neighborliness urges prenatal care for the expectant mother. But not only in these better known activities of public health, but in respect to medical care, people are beginning to understand that much more can be done than is being done to make them well and keep them well.

Moreover, it is now becoming financially important to maintain health, to avert invalidity and premature death. Since pensions are paid from public funds to those left dependent by early death or unnecessary invalidity, since relief rolls are swollen by those unemployable because of preventable illness, there has begun to be a serious interest on the part of both public official and tax paying citizen in doing what we know how to do to remedy the situation.

Many tentative suggestions have been made. Many partial or make-shift programs have been proposed. Until recently, however, we have not had a plan for an adequate national health program. The first comprehensive and concrete idea of the health needs of the country was obtained from the National Health Survey in the course of which the sickness story of 2,800,000 Americans was summarized, a cross section of 876,000 families from both the rural and the urban population. Based on these data, together with other findings during the past few years, a statement of national needs in health and medical service was reported to the President last February by the Interdepartmental Committee[1] appointed to coordinate health and welfare activities of the Government.

National health needs may be considered briefly in four broad categories, as follows:

1. Preventive health services for the nation as a whole are grossly insufficient.

2. Hospital and other institutional facilities are inadequate in many communities, especially in rural areas, and financial support for hospital care and for professional services in hospitals is both insufficient and precarious, especially for services to people who cannot pay the costs of the care they need.

3. One-third of the population, including persons with or without income, is receiving inadequate or no medical service.

4. An even larger fraction of the population suffers from economic burdens created by illness.

At the suggestion of the President, a National Health Conference was held in Washington in July under the auspices of the Interdepartmental Committee. To this conference were invited representatives of organized medicine and other

1. Made up of Assistant Secretaries of Treasury, Labor, Interior, Agriculture and the Chairman of the Social Security Board.

professions concerned with public health, together with representatives of the public whose needs are to be served. The needs of the American people for health and medical care were outlined. Five definite proposals were made concerning methods by which we, as a nation, may be able to meet these needs. Individually they deal with specific aspects of the problem. Together they form the first inclusive plan by which public health action may be undertaken on a national scale and with sufficient impact to raise the health status of the population as a whole.

The first proposal was for the expansion of public health and maternal and child health services in order to minimize the risk of illness, to reduce its current volume, by expanding present federal-state cooperation under the Social Security Act.

To meet the great deficiencies in our physical equipment for good health, it was recommended that additional hospitals, mental and general, tuberculosis sanatoria, health centers and rural hospitals be built.

To provide medical care for the underprivileged third of the population it was recommended that public medical care be provided for the dependent groups and for those who, although able to obtain food, shelter and clothing from their own resources, are unable to procure necessary medical care.

To meet the economic burdens of unpredictable illness among self-supporting persons, it was recommended that either general taxation or special tax assessments or specific insurance contributions or a combination of these methods be used to provide the funds. The rôle of the federal government in this respect properly should be restricted to giving financial and technical aid to the states in the development of sound programs of their own choice.

The fifth recommendation was that present social security laws be broadened to provide cash payments for wage loss during illness or as a result of permanent disability.

When your present freshman classes are ready to go into the practice of medicine they probably will find an integrated effort on the part of governments —federal, state and local—to control those great causes of disease and death against which we have scientific weapons of proven power. It is probable that the first objectives will be syphilis and cancer control, better maternal and child health work, in which the federal government already has taken a position of cooperative leadership. It is likely that we shall be well launched in a concerted effort against tuberculosis, pneumonia, and preventable diseases with a regional distribution, such as malaria, pellagra and hookworm.

Substantial headway should have been made in meeting the estimated shortage of 400,000 general and mental hospital beds, if all areas are to be provided with facilities which meet minimum standards. Also, the process of leveling up should have started, especially in tuberculosis sanatoria, where twenty-six states have a shortage of 50,000 beds, providing for each annual death less than one bed public or private. Upstate New York, by contrast, provides two and a half beds for each annual death from tuberculosis. Yet by no means will all of the

emphasis be placed on new hospital construction. Of equal importance is the subsidy of existing voluntary hospitals, including the religious, for the overwhelming burden of free care they now give, and for the care of other persons now unable to secure it.

Along with this we almost surely shall see locally administered plans with state and federal aid to provide essential medical care of the population on relief, and other medically indigent persons.

No one can foretell the directions which will be taken by the self-supporting groups of the population to budget the cost of the unpredictable illness. An extension of public medical service, or health insurance, are alternate methods, but not mutually exclusive. The greatest freedom should be allowed each state in working out one or the other method or a combination of both. Voluntary hospital insurance is being extended daily. Various group health insurance plans already cover a considerable number of people.

There is a unanimity of opinion that present unemployment insurance laws will be extended to provide also payments to workers unemployed on account of illness.

It seems inevitable, likewise, that public funds will be used increasingly to promote scientific research in the basic problems of health and disease. Appropriations of the Public Health Service now are being used in cooperative studies with a number of institutions throughout the country. Through the National Cancer Institute, grants-in-aid of such studies are specifically authorized. Similar studies relate to syphilis, gonorrhea, tuberculosis, pneumonia, narcotic drug addiction and a score of other urgent problems. In addition, federal funds now granted to the states are used for the training of public health personnel. More than 3,000 persons have received postgraduate training in public health under fellowships provided from federal health appropriations. With the current reduction in income from private endowments and the apparent drying up of new sources of philanthropy, it seems inevitable that medical education and research will need increasing public support if our medical colleges are not to curtail their activities.

I have emphasized the importance of research because the future of public health in this country will depend not only on the better application of what we know, but on seeking constantly to expand our knowledge.

All of us, no one more than myself, have been surprised at the ground-swell of public interest aroused by the National Health Conference, and the support from all quarters which has appeared for the principles and for many of the proposals of the health program. The medical profession of the country through the House of Delegates of the American Medical Association has endorsed specifically, or in principle, four of the five proposals made at the National Health Conference. National compulsory health insurance was opposed but in lieu of it, there was urged an extension of voluntary hospital plans and of voluntary cash indemnity schemes for serious illness. Significant also was the preamble of the report adopted by the House of Delegates which states:

> "Since it is evident that the physicians of this nation, as represented by the members of this House of Delegates convened in special session, favor definite and decisive action now, your committee submits the following for your approval: * * *"

Thus, the way seems clear for cooperation of the medical profession and governmental agencies, federal, state and local, in raising the level of national fitness and reducing the waste of our vital resources through unnecessary illness and useless death.

As I have suggested, it is more than probable that when today's freshmen in medical colleges are graduated they will see a substantial beginning of the national health program. The form that program eventually will take depends in large measure on what they and their generation of medical men contribute to it. Since the time of Hippocrates, we have cherished the ideal that prevention is the first aim of medicine, yet even now, with the scholastic improvement and scientific expansion of our times, there are many great schools where the preventive ideal has not yet been emphasized in the medical curriculum. Both as citizens and as doctors we are surely convinced that the great new responsibility —which has been laid on us for the public health, and for a better distribution of medical care—will require the best minds and the strongest characters. Yet, in a fair number of schools, the first rate graduates still are discouraged from choosing public health as a specialty. Certainly it can no longer be because their advisors see little opportunity for scientific service. I am inclined to think it is because medical faculty members cannot see the woods for the trees; in their praiseworthy and devoted attention to the individual patient, both for themselves and their students, they are unaware of the many thousands of patients not receiving needed attention. They lose perspective as to the relative importance of medical problems.

Further, those who teach the doctors of the future are giving them less than they are entitled to, if they are not taught concerning the world in which they must live and work, and especially the relation of medicine to that world.

There are few citizens nowadays who do not believe in the basic right of all citizens to be born in health and to maintain health. There are no lines of political demarcation on this point, as has been abundantly proven in the last two Congresses. Medicine has become a great social force. Medical graduates must have more than clinical acumen and technical proficiency. They must be trained to use scientific disciplines for the benefit of all the people. In the study of medicine, as in its practice, the doctor needs to see beyond the point of his scalpel. The vividness of his near vision must not bar out the equally clear, long view of the social and economic conditions which cause disease and are caused by it. His sense of responsibility toward the community is no less vital a part of his ethical equipment than his sense of duty toward the individual.

As we think in terms of leveling up public health and medical service for the poorer areas of the country, I disagree with those who advocate inferior train-

ing of doctors and nurses who will practice there. On the contrary, I believe that such practitioners should be trained with particular care, and that facilities for modern practice should be provided for them. The "horse-and-buggy" doctor has passed on, except for purposes of romantic appreciation. It seems more desirable to reduce the cost of medical care by bringing patients to a well equipped, well staffed medical center, than to sacrifice the quality of the persons who administer care.

In connection with this, we do well to remind ourselves that better facilities, better training, and more opportunities for the Negro nurse and doctor will reap a large return in many neglected areas of the south than almost any other investment we can make for the health of the American people.

The needed extension of public health service against the leading preventable causes of disease and death will require a strengthening of local health departments and the training of a large number of persons for careers in public health. This will be an important part of the work of many universities in future years. We have in this country a few well endowed, efficient schools of public health. Recently several other schools have established short courses to meet emergency demands for trained persons. These short courses, admittedly, were of a temporary nature, to be replaced as soon as possible by a full academic year for public health officers in administrative positions. Studies concerning the adequacy of present public health instruction show the need of increasing by 50 per cent the facilities now available. A much larger increase is needed for the national health program which is in prospect. The training of doctors in public health schools, up to now, has been, primarily, for administrative health officers. As the scope of public health action has expanded to include such subjects as industrial hygiene, the hygiene of maternity and infancy, the control of venereal diseases, of tuberculosis, of pneumonia and cancer, administrative health officers are urgently needed who are skilled in other specialties of medicine no less than in epidemiology, biometrics and public health administration. Increasingly they will be needed in the future. This will require a closer association of the schools of public health with the teaching of clinical medicine. Essential, too, are practice areas, health districts with a model organization, in which clinical instruction can be given in public health methods. Such an area is as essential to a public health school as is the hospital to the teaching of clinical medicine.

Since public health courses are becoming popular, I fear that too many universities without adequate support will undertake to set up inferior courses. We must not repeat in public health the mistakes of the last generation in medical education.

A committee representing all of the medical schools of the country in which postgraduate instruction in public health is being given, consulted with the Public Health Service more than a year ago concerning the future needs in public health training. This committee recommended at least three additional well endowed schools or institutes of public health, located desirably on the west coast, in the middle west and in the south.

The national health program is designed deliberately to develop along evolutionary lines. If you, the deans of the medical colleges, keep closely in touch with it, if you fit your curriculum to its needs and its potentialities, you can make of it a splendid achievement, completely consistent with the American tradition and the ethical ideals of medicine. Organized medicine has shown a commendable desire to work constructively to these ends. Only by doing this, I believe, will it be possible for the doctors to take the lead in putting medicine to work for all of the people, rather than letting the program go by default to the politicians who will put the doctors to work for them.

This is a long range program to take shape deliberately and to go forward with the approval and cooperation of the communities to be served. Every statistician, every practical business man who has looked carefully into the cost of it has pronounced the plan much cheaper in its operation than in its neglect. We shall spend much less, federal and local governments together, to do a good job on health than we now waste, in our casual, careless and tragic lack of doing.

If I leave no other word with you, remember this one thing. What we have been discussing is a people's fight for life. We are deluding ourselves if we belittle its earnestness, its tremendous energy. We shall do a great service for ourselves and the nation if we give to it our sympathy, our understanding and our skills. It may be the greatest contribution to social peace in our day.

# The Place of Preventive Medicine in the Medical Curriculum*

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In recent years, an impressive increase of interest has been manifested not only in the place of preventive medicine in the medical curriculum but also in the scope of the subject and its relation to other disciplines.

After more than twenty years of consideration of this subject, and at the conclusion of an extended inquiry into the present status of undergraduate instruction in preventive medicine in twenty-six countries in North America and Europe recently undertaken on behalf of the Rockefeller Foundation, I have ventured to draw certain tentative conclusions.

The development of suitable courses of instruction in this subject will depend to a very considerable extent on the relationships, resources and facilities available not only in the medical school but also in the community in which the school is situated. It is of prime importance to relate, if possible, the activities of the department of preventive and social medicine to public health and social agencies, access to which may, perhaps, be arranged. In that connection I may repeat certain observations which I made in 1924 on this subject.[1] In dealing with the organization of public health teaching in cooperation with departments of health it was suggested that: "A satisfactory partnership between departments of health and teaching departments in the medical school is of very great importance from the standpoint of the community. A mutually helpful relationship is impossible, however, unless all concerned share both the responsibilities and the benefits which may accrue from such an arrangement. In other words, it must be good for the university, beneficial to the health departments and in the public interest. Health departments are public bodies charged with certain responsibilities in respect of the promotion of health and the prevention of disease. They may be regarded as agencies whose facilities are as essential for preventive medicine teaching as are hospitals and dispensaries for clinical training. Recent progress in curative medicine has been due in no small measure to the intimate relationship of wards and laboratories in the best medical schools. Has the time not arrived to attempt to secure similar arrangements for training in preventive medicine?"

For purpose of general orientation, the relationships, the agencies and the departments of the medical school necessary for adequate and comprehensive

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1. DeLamar Lecture, Johns Hopkins University, October 13, 1924.

instruction in preventive medicine are listed below. These have recently been considered in detail elsewhere.[2]

1. PUBLIC HEALTH AND SOCIAL AGENCIES
   Assistance through part-time staff appointments of public health officials.

2. UNIVERSITY INSTITUTES, DEPARTMENTS OR CLINICS
   (a) *Medicine:* tuberculosis; venereal diseases; social service.
   (b) *Surgery:* social service; industrial hygiene and industrial clinics; ophthalmology (sight-saving); orthopedics (follow-up service for anterior poliomyelitis convalescents, etc.).
   (c) *Obstetrics:* antenatal service; postpartum follow-up; instruction regarding contraception.
   (d) *Pediatrics:* infant and child hygiene; milk depot; child guidance clinic; nursery school.
   (e) *Psychiatry:* mental hygiene, including child guidance clinics (unless provided for elsewhere); psychiatric social service; psychiatric service in schools, juvenile court, auxiliary classes, vocational schools.
   (f) *Preventive and Social Medicine, Public Health and Hygiene:*
      i. Access to health departments for school health services, special classes, general services, laboratory, epidemiology, sanitation, food control, public health nursing, social agencies.
      ii. Facilities for bacteriology, immunology, statistics, epidemiology.
      iii. Access to student health service.
   (g) *Physiology or Physiological Hygiene* (including *Biochemistry*): Nutrition; personal hygiene; industrial hygiene; introduction to statistical methods; ventilation, illumination, etc.
   (h) *Bacteriology:* teaching and research, including study of viruses; immunochemistry and chemotherapy.
   (i) *Applied or Human Biology:* perhaps included in preventive medicine or anatomy—anthropometry; eugenics; studies in human heredity; statistical methods. With Medicine: studies of "constitution."
   (j) *Interdepartmental facilities for combined activities, such as:*
      i. Clinical conferences or clinical lectures: medicosociological; communicable disease clinics.
      ii. Domiciliary visits: medical social service or public health nursing, or district visiting nurse service.
      iii. Periodic health examinations (in student health service?).

The extent to which the students are taken into the health department for demonstration, field work and practical instruction, will depend on the scope of work and the program of the official agency. Any well organized modern department of public health probably possesses the essential services with which the student should be familiar. It is not assumed that the suggested responsibilities of the various departments of the medical school are necessarily as complete or as comprehensive as they might be. They may, perhaps, be regarded as being reasonably adequate at the present time.

It will be observed that provision is made for a separate department of preventive and social medicine, public health and hygiene. The weight of opinion

2. J. Am. M. Assoc., 110:1321, 1938.

at the moment seems to be in favor of such an arrangement. That department, presumably, will be the one which will endeavour, through cooperation and consultation, to focus attention on the ever expanding needs of preventive instruction, and by suitable means ensure integration of effort and close collaboration of the work of instructors in the various departments.

I may, perhaps, be permitted also to repeat, in part, what I have recently written elsewhere in respect of the subjects to be taught[2].

"The precise activities of departments of preventive and social medicine will naturally vary in different universities. But in broad outline they may be sketched. Certain aspects of applied physiology or physiological hygiene should be developed and taught. An extension of human physiology should be carried on for the study of normal ranges, so that the bases of methods of health examinations and health teaching may be made more secure. Relationship with school health services or, better still, partnership with the university health service should be established. The opportunities for investigation therein would be many and valuable. Certainly undergraduate medical teaching should be organized and preferably initiated in this ideal setting. Students would carry on their studies of 'normals' in an atmosphere in which diagnosis and treatment of the sick are not a duty or a necessity.

"Combined with the study of function should be that of structure. Careful anthropometric measurements should be taken and recorded. Inquiries should be instituted into human biology (heredity) and eugenics . . .

"The positive approach to the teaching of preventive medicine through applied physiology or an extension thereof is most desirable and logical. Observations on growth and dietary studies (of healthy persons) are other suitable topics for class work.

"The introduction, then, is based on the concept that health promotion and maintenance come before disease prevention and that other aspects of the subject should be introduced to the student only when he has had opportunity to comprehend and apply the preventive idea."

I do not propose at this time to elaborate in great detail the courses which might be offered in order to illustrate the general principles of epidemiology, the hygienes, special public health problems of the country, health services in industry, public health engineering, public health laws, organization and administration. I reiterate that such instruction obviously should be designed for future medical practitioners and not for graduate students in public health. It will be observed that much of the time devoted to instruction in the program of studies illustrated in the above outline is concerned with disease prevention, and, to a quite limited extent only, with the observation of environmental conditions which may predispose to ill health or maladjustment. The student is afforded an opportunity of acquainting himself with the existing machinery for the maintenance of the public health.

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2. J. Am. M. Assoc., 110:1321, 1938.

There is, however, another and, it seems to me, more important phase of the subject with which I wish now to deal very briefly. At the annual meeting of this Association last year two exceedingly interesting papers were read by your past President, Dr. E. Stanley Ryerson. These were entitled "Health and Medical Education[3]" and "Cultivation of Health in Relation to the Medical Curriculum[4]." Quite independently, Dr. Ryerson and I have arrived at the same conclusion, namely, that an organized effort should be made to teach the subject of health as well as the principles of disease prevention and their application. Opportunities or facilities should be provided for the application of appropriate methods of inquiry in physiology, psychobiology, biochemistry, anthropology and human biology, for the assessment of physical and mental fitness. In other words, there should be developed courses of instruction in which, in practical exercises and in small tutorial groups, structure and function of presumably healthy persons at various age periods would be investigated. Dr. Ryerson has stated this principle concisely in the following terms: "The objective of the first part of the medical course should be the attainment of the knowledge of man in a state of health."

Since we are here concerned with the feasibility as well as the desirability of modification, rather than extension, of present courses in the program of medical studies, such proposals will obviously require most careful consideration and discussion by those who would be responsible for such rearrangements and for the initiation of this new type of instruction. The environment in which such undertakings could be launched would, as I have suggested, be the student health service and, perhaps, also public health clinics maintained for the observation of normal individuals, infants and young children as well as adults. At the present time it is highly probable that much of the time and effort devoted to periodic health examinations and routine health supervision is wasted because of serious gaps in our knowledge of the range of normal function. It is to be hoped that inquiries would be carried on in an effort to increase our understanding of normal healthy man and the factors and influences which contribute to or maintain a sound mind in a sound body.

There is almost nothing essentially new in the proposals of either Dr. Ryerson or myself. Nearly twenty years ago there was established at the University of St. Andrews in Scotland, by the late Sir James Mackenzie, an Institute of Clinical Research. As outlined by that great clinical investigator, the objectives were really those which we are now discussing. Another institution of quite similar character and analogous purposes has recently been organized in London, the so-called Pioneer Health Centre, at Peckham. It is with chagrin that one realizes that, at this late date, in no medical school with whose courses of study I am familiar has even the most modest beginning of such a plan been put into operation. Medical students today, perhaps as much as at any time in the past, are thinking essentially and almost exclusively in terms of disease and to a very slight extent only of health and of disease prevention. Surely, the time is ripe for

3. J. Assoc. Am. M. Coll., January, 1938.
4. Ibid.

the formulation of a definite program which would permit a start to be made in the direction here suggested. Substantial adjustment of outlook and effort will not be easy. Because of the constantly increasing volume of knowledge of disease states, our attention is occupied almost entirely with the abnormal, and there is also an ever increasing burden of responsibility being placed on the physician to assist in the alleviation of social maladjustments, poverty, destitution and their concomitants. If, however, we are to continue to focus our attention exclusively on what might be described as the negative aspect of these important subjects of health and preventive and social medicine, we are almost certain to find that other professional groups will be asked to assume responsibility for the inauguration and conduct of projects for the improvement of the physical and mental status of the population at large. An illustration of this is to be seen at the present time in Great Britain. A great campaign has been inaugurated to improve nutrition and to raise the standards of physical health of millions of people. Already it would appear that neither in the universities nor in the public health organizations nor in the medical profession at large are there persons fitted and qualified to guide and direct such novel but immensely important endeavours. Perhaps this Association, by some means, could undertake a reform in the program of medical studies which is long overdue and which would, regardless of the inherent difficulties, lead to developments of immense value and of far reaching importance.

The Association of American Medical Colleges has already to its credit many first rate achievements. The possibilities which I have thus briefly outlined merit more consideration and study than has as yet been accorded them.

# The Integration of the Teaching of Preventive and Clinical Medicine*

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Although remarkable progress has been made in enlarging the facilities and in improving the methods of teaching the clinical branches in the medical curriculum, there has not been a comparable advance in providing facilities for teaching the preventive and public health aspects of medicine. This statement has been made so often that it has become commonplace, and yet I wish to call attention to the fact that this deficiency in medical education is proving unfortunate because (1) there is unusual interest on the part of the public in the prevention of disease and in health activities (2) the practitioner of medicine should make a much larger contribution in applying the knowledge which is now available in the control of preventable disease and in the protection of individual and community health; (3) there is urgent need for physicians trained in public health to fill positions in official and non-official health agencies; and (4) there is an increased demand for graduates of medicine who are prepared to teach and carry on research in the field of public health. These observations emphasize the immediate necessity of affording better facilities for undergraduate medical students to acquire the newer knowledge in preventive medicine and public health. Unless this is done, future practitioners of medicine cannot take adequately their places in the rapidly expanding national health program.

Obviously, conditions within and particularly surrounding medical schools vary greatly, and therefore, no plan or system can be applied uniformly to the instruction of undergraduate students; nor is there any easy approach which will facilitate instruction in this phase of medical service. Results can only be attained by constant attention to details by the teaching staff concerning any plan which may be developed; and methods of instruction must be employed which will gain the interest and maintain the respect of the students.

An important objective in any plan of teaching undergraduate medical students is to integrate the teaching of preventive and clinical medicine. It is my judgment that this cannot be accomplished successfully by placing the responsibility on the medical faculty as a whole; neither can it be obtained by sporadic effort or fragmentary instruction; but procedures should be employed which will afford the student an experience comparable to that gained in well organized courses of anatomy, pathology, physiology, surgery, pediatrics and other subjects of the curriculum.

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Much factual information in the field of public health and prevention of disease is available now, the application of which will prove invaluable in the practice of medicine. This information must be organized and presented to the student so that he not only can acquire techniques which should be employed but he should be imbued with his responsibility in the practice of preventive as well as curative medicine. It seems logical, therefore, to accentuate the thesis that medical schools should have full-time departments of preventive medicine and public health with reasonably adequate budgets and with facilities for giving systematic instruction to undergraduate students as an essential part of the curriculum. If this is not done, it would seem to preclude the possibility of a large proportion of graduates of medicine becoming competent to practice preventive measures and to cooperate effectively in the state and local health programs.

The general medical faculty can make a contribution also by imbuing the student with his responsibility as a future practitioner in the application of preventive measures. All clinical courses can make some contribution in the instruction of students concerning the practice of the public health aspects of medicine. Students gain experience in antepartum and postpartum care in the outpatient clinic of every well conducted teaching hospital. Immunization procedures should be and usually are practiced in the pediatric clinic. The subject of nutrition is emphasized in the courses in physiology and biochemistry and the application of this knowledge is taught thoroughly in clinical medicine. The contact of the student with patients at the bedside and in the outpatient clinic affords opportunity to get some knowledge of dietetics. His experience in surgery should give him a sense of responsibility concerning the value of early diagnosis, methods of treatment and the prevention of cancer. The measures that may be employed in the prolongation of life and in the reduction of mortality from heart disease, as well as their limitations may be acquired in clinical medicine. Likewise, the diagnosis and treatment of tuberculosis and the value of case finding procedures can be emphasized in medical and pediatric clinics. It is through and by these measures that closer affiliation or actual integration can be established by practitioners in a community with the program of the state and full-time local health organizations.

Dramatic consideration has been given within recent months to a national program for the prevention and control of syphilis. This widespread disease generally has been diagnosed poorly and treated inadequately. We know the technique and skill required for the arrest and cure of the majority of those persons who have latent and active forms of this disease, but there is great need for a more intensive clinical experience and a knowledge of epidemiologic methods necessary in the location of cases and contacts, and in general follow-up procedure to bring under treatment persons infected with syphilis. The epidemiologic approach requires a peculiar technique, if results are to be secured, and much blundering by those who are inadequately trained may be the outcome. Unless the diagnosis and treatment of syphilis, particularly in the syphilis clinic used for teaching, are coordinated with epidemiologic field invetigations,

results cannot be obtained commensurate with the expenditure incurred. Therefore, undergraduate medical students should not only be given clinical instruction, but they should also have some knowledge of epidemiologic principles and their application in a case finding program and their significance in the control of this disease. It will prove of tremendous value if the medical profession is mobilized in a national program for the suppression of this plague and, therefore, future graduates of medicine should be imbued with the responsibility which they should assume in a syphilis control program.

Well organized and well administered local, county and municipal health departments can be used for giving the students some knowledge of the practical aspects of public health. This avenue may afford an experience which is analogous to the "clinical clerkship," broadly speaking, in medicine. Some years ago, under the direction of Dr. John B. Grant of the International Health Division of the Rockefeller Foundation, clinical clerkships in public health were a part of his program in teaching public health in the Peiping Union Medical College. Every student was required to spend four weeks working in a field area of the city health department, and following this experience he could devote an additional three weeks to some special phase of public health. The student gave all his time to this work during this period and worked under supervision. The students may be required, also, to make careful sanitary surveys of the health department of a small city as a means of gaining experience in the plan of organization and in the techniques of public health. This method of instruction was used first by Dr. M. J. Rosenau at Harvard University for a number of years. Field demonstrations, in an efficiently administered full-time rural county or district health department, carefully planned and conducted, and special field studies can be used effectively in introducing the student to the principles and operative procedures in the practice of preventive medicine and public health.

There was established at Harvard University several years ago by Dr. David L. Edsall a series of "clinics in public health," which I presume are being continued. I believe there were twenty-one of these clinics, conducted by men who were especially competent to deal with the particular subject presented. These clinics were set apart to emphasize the integration of preventive and curative procedures in practice. This objective may be attained also by holding a limited number of clinics, as is done at Vanderbilt, in cooperation with the department of medicine by having a representative of the department of preventive medicine and public health participate. This has the advantage of not being a set clinic in public health because it is done by invitation from the department of medicine to have a "combined or joint clinic." These clinics have been held cooperatively on typhoid fever, undulant fever, malaria, lead poisoning, and other subjects. They can be made very instructive, particularly if the clinical clerk in advance investigates the causative factors or background of the disease as a part of the clinical record which he is requested to present after the patient's case has been discussed by the professor of medicine, with reference to diagnosis, symptoms, pathology, prognosis and treatment. The clinical clerk, in discussing his field

investigations, may use stereopticon slides to illustrate his findings. This is followed by comments by a representative of the department of preventive medicine and public health. The presentation of these facts is, necessarily, brief but impressive. These clinics may be of much interest as a means of correlation between the activities of the two departments and afford opportunity to present a well rounded discussion acquainting the students with the background or causative factors of the disease which has caused the patient to seek admission to the hospital.

Other ways may be used to integrate the teaching of preventive and clinical medicine. We have at Vanderbilt a laboratory course in parasitic diseases, not parasitology from a zoological standpoint, which considers the prevalence, distribution, mode of infection, symptoms, treatment and measures for the control of these communicable diseases. This phase of teaching emphasizes diagnostic methods with reference not only to clinical medicine but to public health in epidemiological investigations. This course is given during the third trimester of the second year and serves as one of the introductory courses preliminary to entering on a more intensive study of clinical medicine in the third curricular year.

A cooperative arrangement may be developed also between the departments of bacteriology and public health. For a number of years we have given a limited number of lectures, correlated with the laboratory work in bacteriology, in the application of epidemiological principles in the control of certain infectious diseases. These discussions are given following the laboratory work on groups of infectious organisms, such as the gram-negative and gram-positive cocci, colon-typhoid-dysentary group of organisms, respiratory infections, spirochetal infections, and some emphasis is given to personal hygiene and the broader aspects of public health. Only about eight of these lectures are given in our course. These discussions are held during the first trimester to second year students. We believe this arrangement has strengthened the teaching in both departments.

A member or members of the department of preventive medicine may attend ward rounds with the professional staff in clinical medicine with reasonable frequency. This affords an avenue for participation in the discussion of cases which involve public health problems. Thus, the house staff, as well as members of the professional staff in medicine, become interested and may be stimulated to cooperate in their own teaching concerning the preventive phases of medicine. We have for several years found it also worth while to assign a representative of our department to the Outpatient Clinic three mornings during the week to participate in the examination of patients and to serve as a consultant in preventive medicine.

There are also research problems which may be developed more successfully on a cooperative basis between two or more departments, and members of the department of preventive medicine may participate. We have availed ourselves of joint research projects with the departments of anatomy, pharmacology,

clinical medicine, pediatrics and pathology in the School of Medicine, with the department of sociology in the College of Arts and Science, and with the State Department of Public Health. This correlation increases one's efficiency in teaching and serves to impress the students with the productive value of the integration of preventive and clinical medicine, or also with the basic medical sciences.

At times there are problems which confront individual members of the clinical staff, and cooperative relations may be established which afford opportunity for the department of preventive medicine to make contributions in the solution of them. In other words, the department should serve as a source of information, or, so to speak, a "clearing house" especially for clinical departments, as an aid in the solution of problems which involve the consideration of the preventive aspects of medicine.

The spirit and attitude of medical students concerning the department of preventive medicine and public health will depend largely on informal contacts which they have with those who are primarily responsible for this phase of instruction. This may be facilitated by conferences concerning discussions which are prepared for seminars, and also environmental case studies. The assignment of papers in journals to abstract, dealing with various subjects in public health, requires additional conferences with some member of the teaching personnel in preventive medicine, which should prove stimulating and informative to the student. This may be done by having a list of well selected papers distributed to members of the class and requiring each student to abstract two or more papers each month throughout the regular course in preventive medicine and hygiene. This is facilitated by providing the student with an outline which is suggestive in the preparation of the abstract. This develops orderly reading and habits of logical expression, and causes the student to seek information from original sources and current literature.

I have endeavored to recount, briefly, some observations and methods concerning instruction in public health, as a result of studies and experiences in dealing with this phase of medical education. It has been my purpose to show that any attempt to instruct undergraduate students in the preventive and public health aspects of medicine requires a full-time teaching personnel which can devise ways and means for enlisting and maintaining the interest of the student. Many procedures may be employed which, if followed up carefully, will be valuable in the integration of preventive and clinical medicine. The favorable attitude and influence of the faculty is of tremendous importance in imbuing the student with his responsibility in the application of preventive measures. An understanding of the administrative procedures and techniques of preventive medicine and public health should cause the future practitioner to cooperate more uniformly with the state and local health organizations by participation in the public health program. This will result in raising the level of achievement in the practice of clinical as well as preventive medicine and community health.

# The Place of Preventive Medicine in the Medical Curriculum*

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I have been asked to speak on the place of preventive medicine in the medical curriculum, a subject in which I have been greatly interested for many years. At previous meetings of this Association, the question has been treated rather fully by men who were well qualified to discuss it, and many of these speakers have presented to you more or less detailed surveys showing the present status of the teaching of the subject of preventive medicine in the medical curriculum. For this reason I shall not at this time give you an additional survey. The data which have been so carefully assembled by Leathers, Bristol, Cumming, Winslow, FitzGerald, Smith, Newsholme and others are available in the proceedings.

From a study of the history of teaching preventive medicine to medical students two general facts emerge immediately. They are: (1) that both faculty and students are interested in having the subject taught well; (2) that very little progress has been made in the past fifty years in developing a thoroughly satisfactory teaching program in most of the medical schools. According to the surveys made by Leathers, FitzGerald and Hiscock, less than twenty, or, with a higher standard, less than ten medical schools give a satisfactory course in preventive medicine.

It is obvious that there must be more than the usual amount of difficulty in presenting this particular subject to medical students. Some schools have attempted to combine a course of instruction for health officers with a course in preventive medicine for undergraduates. Such attempts, I know from personal experience, are doomed to failure as the needs of these two groups are quite different. The teaching of public health to prospective health officers is really a graduate program, just as it is in other specialties. Public health as a career is just as much a specialty as obstetrics, or psychiatry, or pediatrics, and it can best be taught as a graduate subject. Preventive medicine for medical students is quite another matter. Only about 5 per cent of the graduates of our medical schools enter on careers in public health, and there is no occasion for giving all medical students a course which would be suitable for prospective health officers. As a rule, undergraduate preventive medicine is given in the third year, when the students are just beginning the study of clinical subjects and when they have very little in the way of background for understanding the preventive aspects of disease. It would be better for the student, obviously, if the course could be given either wholly or in part, at least, during the fourth year.

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Another major difficulty in teaching preventive medicine is that the subject deals not merely with a single individual but also with the family, the household, the neighborhood, and sometimes with the place of work of the individual patient. When a student sees a patient in a hospital or in an outpatient department only, he learns nothing at first hand about the patient's living conditions and environment. To learn anything of preventive medicine in relation to the particular case, he must visit also the home and place of work, since prevention of disease applies as much to the apparently healthy members of the household or factory as to the patient himself. You can all recall instances of lead poisoning and tuberculosis in which the patient seen in hospital or outpatient department was merely the first of a number of persons, discovered eventually, all of whom were ill in varying degrees. Preventive medicine deals, therefore, with groups of persons and not merely with isolated individuals. Some provision must be made, consequently, in teaching this subject, for students to visit households, places of employment, and for interviews with and examination of the other members of a patient's social group. This takes time and is not always easy to arrange for an entire class, but something can be done in this direction. Osler, at Johns Hopkins, was accustomed to send out selected members of the class to visit patients in their homes, and many others have also arranged for such visits, but it is still too much the exception, not the desirable rule. I am very glad to see that the program for this meeting has set aside most of tomorrow morning for a discussion of this subject.

When the classes are large, as at Harvard, where the third year class is about 135, it is very difficult to make proper arrangements for home visits. It has, however, been possible at this institution to see to it that about one-fourth of the class make such investigations. These students later, in time set aside for the purpose, report to the full class the results of their visits, and are expected to answer any questions about the case or cases which the other members of the class may wish to ask. Student conferences of this sort on current epidemics or on any other sort of preventable disease have been stimulating and are successful in bringing immediate attention and thoughtful consideration to current problems which have presented themselves in the clinics. Where medical classes are smaller, this procedure can be carried out more systematically and with a higher percentage of the class participating.

The investigation and reporting on definite cases by members of an undergraduate class is, of course, an ideal method of teaching, for, as we know from the reports of the National Educational Association, "Educaton consists in the active discovery and pursuit of genuine interests rather than in the passive absorption of knowledge" and, in the end, "educational experience is to be evaluated not simply in terms of the acquisition of knowledge but in terms of total effects upon the personality of the student." It is what the student learns by his personal investigation in the hospital, in the home, and in the class room, where his report is analyzed and discussed, that is truly educational and of permanent value. The actual facts that he discovers are, of course, important for the particular case, but, for his own education, the method and technique used in elicit-

ing the information are probably more important for him. Would it not be quite feasible to require of each student before promotion or graduation that he hand in to his instructor a series—let us say, five—of written reports on the social, economic and environmental factors which are related to the illnesses of the patients to whom he has been assigned and whom he has previously learned to know in the hospital or outpatient department. Such home surveys could be appended to the patient's hospital history and would add greatly to its value, both for teaching and research, and would thus cover both preventive and curative medicine.

The clinic for the teaching of preventive medicine is the accessible part of the community in which the medical school is located. It includes not merely the hospitals and outpatient departments but the local health department as well. Much of interest can be shown in the local and state health departments if they are at all modern in their work. The student learns how birth and death certificates are handled by the statisticians, he learns the advantages of using the standard, international nomenclature; in stating causes of death, he learns the reasons for giving priority to infections and regularly fatal diseases over mere complications, things that many of the older generation of physicians have still to learn. In the health department, the student learns also the extent and nature of the follow-up measures that are taken whenever a physician sends in a report of a case of any notifiable disease, such as smallpox or diphtheria. A better acquaintance with the difficulties and problems which arise in the health department itself will lead to a more cordial coöperation later between students who become practitioners and health department officers.

Of late years, it has been the policy of health departments in our larger cities to decentralize the operations of the service as much as possible, and to organize regional, subsidiary divisions of the department. These regional divisions are usually housed in city buildings commonly called Health Centers. Here, in addition to administration offices, will be found the usual well-baby clinics, prenatal, tuberculosis, venereal and dental clinics, offices for public health nurses and social workers and, often, offices and headquarters for various welfare and voluntary health organizations of the community. In other words, an attempt is made in the health centers to bring about an association of all health and welfare organizations, both official and voluntary, of the community. These health centers make an ideal place for teaching preventive medicine to medical students. The pediatricians and obstetricians have long had good preventive clinics among the apparently well, and these have furnished a model for all of us in organizing and teaching preventive medicine. The opportunities for investigation and teaching preventive medicine are greater in health centers than in outpatient departments or hospitals, since most of the visitors to such a center are either well, or in the early stages of disease—tuberculosis, for example—and they come for diagnosis and to learn where and how they may obtain treatment, if such is necessary. In the case of tuberculosis, syphilis, and other contagious diseases, the health center has facilities and the necessary legal authority to follow up the primary case by an investigation of the household and neighborhood contacts.

In short, the local health center is or can be made an almost ideal clinic for the professor of preventive medicine; through the health center, he can learn the real problems in health of his locality; he can learn the extent, that is, the spread and prevalence, of any disease—such, for example, as tuberculosis or syphilis—in his community. He can learn what provision has been made, or should be made, by the authorities, for the prevention of further dissemination of preventable diseases. He will learn to appreciate the part voluntary agencies can take in preserving and promoting good health. He will be able to see the limitations of disease prevention—due to ignorance, to poverty, to bad housing, and to other economic conditions—as well as the triumphs of preventions, exemplified by the improvement in the death rates for smallpox, typhoid fever and diphtheria.

The value of municipal health centers for teaching preventive medicine to medical students has been recognized by many schools. Toronto, Cornell, Columbia, New York University, Harvard, and Hopkins, for example, already have active coöperative programs with their various municipal health departments.

## CONCLUSIONS

In conclusion, I should like to refer briefly to two factors which are of supreme importance in the proper teaching of preventive medicine; namely, budgets and medical school organization. To consider budgets first: Dr. Leathers, some years ago, found that only a few teachers of preventive medicine had any real department or budget. In most of the schools, the teaching of this subject was a side issue in some other department, usually the department of bacteriology. Without funds, of course, no one can expect an efficient department or adequate teaching.

It is my impression that the deans and faculties of most of our medical schools recognize that the subject of preventive medicine should be presented properly to undergraduate students, and that they would recommend the introduction of proper instruction if funds were available. Some, perhaps many, schools will organize departments of preventive medicine as soon as they have adequate resources. Indeed, some schools were planning to do so when the depression arrived in 1929, and are still prevented by the depression's long continuing effect. And now it has become even more difficult than formerly to obtain new money for education at the university level. In view of this, what can we do? How can we finance the teaching of preventive medicine? I doubt if there is any single answer. It is, however, I think, generally known that in many of our schools some departments have expanded greatly and that the number of persons in them has increased to an astonishing extent. One can but wonder if the preëminence of a department depends on the quantity of the personnel or on the quality of the work. In other words, when the question of funds for preventive medicine arises in a given medical school, might it not be well to examine critically the budgets of all existing departments in the particular school, and to attempt to evaluate the work of each person, with the idea of learning, if possible, whether or not funds already available for research and for teaching

are being used to best advantage? Might it not be pertinent to inquire whether or not the medical student is receiving the best possible instruction to fit him to care for the sick, to teach him how to aid his patients by advice and instruction, in the preservation of their health, and to impress upon him his duty as a citizen in the prevention of disease and the promotion of health in his community?

The internal organization of a department of preventive medicine will vary more or less, quite naturally, depending somewhat on the local problems in hygiene and public health. In the extreme South, for example, parasitology will need more emphasis than in the North. There are, however, certain general principles which will apply universally. The professor who is the head of the department must, of course, be a physician with experience in public health, particularly with contagious diseases. As he is to teach medical students and not health officers, it is my opinion that he should be a well-trained clinician, with some public health experience, rather than a health officer who has specialized in administration. After all is said and done, however, the choice of the professor will be determined by his previous achievements and his knowledge and personality rather than by any rigid standards. The person to be avoided is the narrow specialist.

It goes without saying that the head of the department should be a good teacher, but the chances are that he will not be a good teacher unless he is capable of doing reasonably good independent research and investigation. It is only by his own investigations of current epidemics and other preventable diseases in his neighborhood that he can teach by example, as well as by lecture, and maintain the respect and esteem of his colleagues and his students.

In order that he may be at all times ready to investigate current epidemics either alone or in coöperation with the state and local health departments, the head of a department of preventive medicine must have assistants and technicians and a laboratory. Most of the profitable investigations are, of course, epidemiological and some one in the department must be free to go into the field at any time and to remain there as long as necessary. In the school, there must be a laboratory where the necessary diagnostic work can be done on infections due to bacteria, to viruses, to protozoa, to helminths, etc., and where studies on human, animal and insect carriers may be pursued. And, finally, the professor or one of his assistants must be skilled in the usual statistical studies of the material collected in each investigation. It is only where some such organization exists that substantial contributions can be made to our knowledge of preventive medicine, and that students can be taught properly through adequate field studies. In order to obtain suitable men for the faculty and to set a university standard for the teaching of students, opportunity for field research is imperative.

I have said nothing about the attitude of other members of the faculty toward the teaching of preventive medicine, for it seems to me quite obvious that no school can give adequate instruction in the maintenance of health and in the prevention of disease until all its faculty is able and willing to share in preparing the student for the difficulties he will find in these changing times in adjusting himself to governmental and social relationships of the future.

# Utilization of Health Districts in the Teaching of Preventive Medicine to Medical Students*

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The utilization of teaching districts for instruction of medical students in preventive medicine and public health may be regarded as an old idea applied in a new direction. It traces back to the apprenticeship concept; and its current counterpart in medical education is to be found in the use of the hospital ward for clinical clerkships, or in the training district established for newcomers and graduate students in public health. It differs, however, from each of these in a number of ways. The more important of these differences will become evident as the discussion develops and will not be further referred to at this point. It does seem important, however, to stress, immediately, the fact that not very much is known about this utilization of public health teaching districts; and parenthetically, it may be said, that the more satisfied one is with his knowledge in this direction, the more likely is he to be wrong. As for myself, I not only confess but insist that after a number of years experience along these lines, I find myself still groping and uncertain, and lay claim to no more than that, in retrospect, I am able, occasionally, to recognize obvious mistakes and sometimes can avoid repeating them.

## DESCRIPTION OF TEACHING DISTRICT

When one speaks of a teaching district of this sort, he is referring ordinarily to a specified area of a large city, or to the entire jurisdiction of a smaller one, or to a rural area where, through previous understanding with the health department or other administrative agency concerned, an arrangement has been effected so that the material of the district is available for student observation and study, and where students may participate in an analysis of problems and in the public health practices and techniques designed for solution of these problems. As indicated above, the size of teaching districts varies. One may have less than 100,000, another more than 200,000 population. Each of these extremes appears to offer certain advantages and disadvantages. The smaller districts permit detailed and continuing study of population characteristics and experiences which is not practicable in larger units of population. On the other hand, teaching facilities and material are generally in proportion to the size of the population; and, similarly, the ability of the operating health agency to absorb students is greater in the large than in the small district.

A satisfactory relationship between the medical school, on the one hand, and the health department on the other is essential if this teaching district arrange-

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ment is to function effectively. The actual conduct of public health programs in the district must remain the responsibility and privilege of the operating health agency. As a rule, certain persons occupying key positions on the health department staff are given academic status; and one or more members of the faculty may hold technical or advisory appointments in the health department. Routine services are carried out by persons employed by the health department and other operating health agencies though, in some instances, their work may be supplemented by instructors of the medical school. Herein, both from the standpoint of administration and of instruction, one encounters a situation not found in the ward of a teaching hospital. In the latter, what shall be done for a patient, and who shall do it, and how and when it shall be done, is completely in the hands of a staff representing the medical school; and the selection and utilization of teaching material is carried out entirely by this staff. Contrasted with this, in the teaching district, these matters are necessarily decided by the health department staff and, although the medical school may have some voice indirectly in major decisions, no department of preventive medicine has a sufficient staff to have a member accompany every student on every service or experience in which he participates. For this reason, the instruction which the student receives, and the immediate interpretation of the significance of this or that experience must rest with field workers of the health department who are not necessarily interested in teaching or competent to teach.

One should not conclude from this very frank recognition of a difficulty that the way in which a health department conducts its services in one place or another is unsound, or that the instruction given to medical students by health department workers is inevitably unsatisfactory. On the other hand, it would be equally a mistake to assume that mere existence of a teaching district will assure sound and significant experience for the medical student.

## Material Available

The teaching material available in a district of the kind under discussion may be classified in a number of ways. The classifications chosen here are as to point of origin and kind of material. As to origin, there is, first, the material encountered in hospital wards and clinics; second, the material encountered in public health clinics; and third, the material arising in the routine services of health departments, voluntary public health organizations and social agencies.

The kind of teaching material available naturally varies in quantity and characteristics. One usually can find what one looks for and, conversely, rich veins may go untapped for want of interest, imagination and inquisitiveness. The run of the mine stuff is related to the problems of maternity and infant hygiene, preschool and school health work, epidemiology and control of communicable diseases, tuberculosis and syphilis as public health problems, environmental and personal hygiene and, in some places, industrial hygiene and food control, with more or less material bearing on health education, public health administration and special phases of public health and preventive medicine, as in dental hygiene, conservation of vision, hearing, cardiology, cancer, diabetes, etc.

From this catalogue of items one, theoretically at least, appears to have a wide choice in the selection of teaching material. From a more practical standpoint, however, there are limitations to its use. These limitations are to be found in the fact that it requires relatively a large district to furnish, at the hour wanted, examples and experiences of one sort or another for each student. It must be borne in mind, too, that the time available to the student makes it impossible for him to participate advantageously in certain of these activities. Finally, it is probably more sound to have the student engage in and understand a few judiciously selected public health activities than to provide him with a heterogeneous and confusing experience.

### Apparently Reasonable Objectives in Teaching District

Bearing on the problem of material available in the teaching district, there naturally arises the question of just what one may hope to accomplish for the medical student in this field experience. It is probably too early in this new development to attempt to answer this question completely. It may be stated tentatively, however, that the principal purpose in sending students into such a district is to create in their minds an appreciation of the importance of preventive medicine and the responsibility and opportunity they will encounter for its utililization in the practice of medicine and, to develop in them an understanding of the dynamics of health and disease in the mass. Out of the experiences provided, and from collateral instruction given with the same objectives in mind, it seems reasonable to hope that the student will become conscious of that common ground which exists between clinical medicine, preventive medicine and public health work, and, further, to hope that he will develop a reasonably broad social viewpoint.

It should be noted that the purposes of a teaching district in preventive medicine and public health are set forth above in terms of principles and generalities rather than in detail. It seems unwise at this time to go further than this. However, there are certain negative details worthy of emphasis. The first of these is the failure of most instructors in preventive medicine and public health to bear in mind that a majority of the students they are teaching will become practitioners of medicine rather than health officers and public health workers. They are undergraduate students in medicine, not postgraduate students in public health. To the latter it is, of course, desirable and necessary to emphasize such things as the ultimate details of administrative procedure, or the highly technical aspects of water purification or of sewage disposal. It does not seem desirable to do this in the case of medical students.

The second negative consideration is that these students are not sent into the district to learn clinical medicine, but rather to become familiar with problems of health and disease as they ramify into and affect large groups of people. Thus, while the importance of early diagnosis of tuberculosis is to be emphasized, the teaching of that diagnosis is a function of clinical medicine. It is with tuberculosis as a mass phenomenon that the public health student is concerned, and with preventive and public health practice, and community resources.

## The Place of the Teaching District in the Medical Curriculum

Even though the number of medical schools which have teaching districts is small, there is considerable variation as to when district experience is provided for the student and how many hours of such instruction are given. There are also marked differences in the kind of material selected and in methods of instruction pursued. In general, teaching district experience is provided in the fourth year, but, in some schools, it is provided in the third year, and, in still others, in both years. The amount of time involved varies from eighteen or twenty hours to more than one hundred hours. There is even more variability in the kind of experience provided for the student than in the number of hours allocated for this work. One department of preventive medicine attempts to emphasize the social and economic aspects of field problems; another, dealing with a similar problem, say, the problem of syphilis or tuberculosis, is inclined to utilize the individual case in making the student more proficient in diagnosis. An instructor from a third medical school might utilize the same sort of case to stress the epidemiology involved or to discuss the administrative machinery set up for handling such problems. Again, one finds differences in the spacing or continuity of student experience in the teaching district. A given department of preventive medicine may provide continuous instruction for from two to four weeks, during which time the student is concerned only with field work in preventive medicine and in public health; another may provide one afternoon a week for most or all of the academic year.

It seems highly desirable that these various concepts and approaches should all be tried out and, conversely, it seems undesirable that any school varying as it must from all others in facilities, resources and policies, should adopt in its entirety the procedure and detail of programs followed by some other medical school.

The question as to when medical students may be most advantageously provided with this type of instruction is not easily answered. As in other matters, too many variables enter into the situations of the respective schools to make a standard procedure applicable. One guiding principle does, however, appear to be emerging. It is this: Health district experience bears to general instruction in preventive medicine and public health the same relationship that clinic and ward work bear to the general teaching of medicine. It would seem to follow that health district teaching may best be given after the student has had preliminary and systematic instruction in basic public health subjects comparable to the preclinical studies.

## The Utilization of the Teaching District in New York University College of Medicine

Heretofore, discussion has been mainly in the form of generalizations, with a conscious attempt to avoid emphasis of my own opinion. In order to bring the discussion to a focus, however, it seems desirable now to provide a specific description of a teaching district actually in use. For this purpose, the procedure in New York University College of Medicine is considered. It should be

understood, however, that this plan is presented not as an ideal, but rather as Exhibit A. Naturally, it is believed that it has more assets than liabilities, that it is more nearly right than wrong, but it is at the same time recognized that experience and the further development of details will reshape it to a considerable extent.

The teaching district of our College is the southeastern quarter of the Island of Manhattan. It has a population of a little more than 200,000. This population is, in general, in the lower economic level, is to a great extent foreign born or of foreign parentage, and is neither well housed nor steeped in the principles and practices of personal hygiene. It may be described as the kind of population thoroughly entitled to dispensary care. The district health officer is well trained, competent and energetic. He is an instructor on the staff of preventive medicine of our college, and the head of the department of preventive medicine is on the advisory committee of the district. The city health department is erecting a new building on property deeded to the City by New York University, and this building will not only house the staff and clinics of the district health department, but the two upper floors will provide offices and laboratories for the department of preventive medicine.

The third year student comes formally in contact with field problems in preventive medicine and public health. This experience is somewhat tentative and limited. During the year, each student is assigned a number of cases for study. These cases are selected from those which have been assigned to him in clinical medicine—on the ward, or in a clinic. Over and above the clinical knowledge which he has obtained, he is required to develop a study of the preventive, economic, social and environmental factors as they may affect the health status of the individual, his family, associates, and the public at large. The results of investigations of this sort, which involve home visits, conferences with social agencies, etc., are reported back in seminars held each week. From a teaching standpoint it tends to demonstrate to the student the interrelations between clinical and preventive medicine and to emphasize the opportunities and obligations which the clinician will meet in the course of his practice with individuals and families. In the seminars, which are conducted by the department of preventive medicine and are participated in by representatives of other departments, the preventive aspect of the condition under discussion is reviewed as completely as it is possible, and the implications of the particular problem, as it relates to the mass, is developed in detail.

In the fourth year, the students participate most actively in the work of the public health teaching district. These fourth year students are scheduled for four weeks clinical clerkships in this field. The net field time involved is about ninety-six hours. These clinical clerks come to the department of preventive medicine in groups of ten and, as is indicated above, remain for four weeks. An individual schedule is prepared for each student, and an effort is made to avoid overconcentration of students at a particular point at a given time; in other words, not more than two students are present at a syphilis clinic session; only one student, at a time, accompanies a public health nurse on a routine day's

work, and usually only one, or, at most, two at a time, would participate in the investigation of a case of a communicable disease.

Routinely, the cases or problems which these students encounter are those commonly found in the operating services of health agencies: problems and services in maternity hygiene, in infant and preschool hygiene, and in the schools; communicable diseases, both acute and chronic; problems in industry, in housing, in personal hygiene. They enter into situations where unemployment and low income employment make simple procedures complicated; where ignorance, prejudice and shiftlessness nullify competent efforts, and where public health resources may be balanced against public health ills. Seminars for questions, observation and discussion of recent experiences are held once a week for the entire group.

## Summary and Conclusion

Out of these various considerations certain conclusions may be drawn tentatively, somewhat as follows:

1. The health district appears to be a facility of value in teaching preventive medicine to medical students.

2. At present this value is more potential than actual, as the undertaking is relatively new and no real body of fact and experience is available.

3. The content and method of instruction of medical students should be scaled to their needs rather than to those of post graduate public health students.

4. Instruction in health districts may well be correlated with clinical work, but should not duplicate instruction provided better by the department of medicine.

5. A serious present difficulty is that details of instruction must be furnished by persons whose major interest lies outside the teaching field.

6. Instruction in subjects basic to an understanding of preventive medicine and public health should precede instruction in health districts.

7. Medical schools with formally designated health districts possess a distinct asset in teaching preventive medicine and public health, but such teaching districts do not solve completely the problem of providing instruction in these subjects.

DISCUSSION ON PAPERS OF DRS. FITZGERALD, LEATHERS, RUSSELL AND MUSTARD

DR. ALFRED E. SHIPLEY (Long Island College of Medicine): Fortunately, I was not asked to prepare a fifth paper to present at this meeting because I am in agreement with the four speakers and I would only be duplicating their remarks. As leader of the discussion, I might very well emit a fervent "amen" and sit down; but some points of definite significance have been brought out and, perhaps, are worthy of a little emphasis.

The history of medical education, so far as America is concerned, indicates that the kind of training men and women have had for the practice of medicine has depended and still does depend, in large measure on the experiences and requirements of the medical profession. From Colonial days, when there were individual preceptorships which gradually developed into organized preceptorships in medical schools, the training of medical students has been based almost exclusively on clinical needs.

With the advent of preventive medicine, certain factors entered into the field of medical care which heretofore had not played a part. Health was emphasized and there came into action non-medical forces, such as health departments and voluntary health agencies in the various communities. The result has been, as Doctor Leathers pointed out, that we are facing today the demands of a public for more definite community care of the sick and the preservation of health.

On the other hand, as Doctor Leathers said, our medical profession has seized very slowly the opportunities and responsibilities which this altered concept involves. The medical profession, to a large degree, had to be forced to participate in many of these community health measures. There has been a lag on the part of the medical profession which has been reflected back into the medical colleges, because it is through the medical profession that medical education has been guided.

And so, a vicious circle has been created. We are graduating from our medical schools men and women who are not trained for the requirements of preventive and community medicine.

Preventive medicine has developed as the result of three or four major phases:

FIRST: Mass sanitation, largely the result of empiric observation that pure water supply, sewage disposal, and the like, were related in some way to the spread of disease.

SECOND: Disease control, stimulated largely by Pasteur when only 75 years ago he recognized the definite relationship of micro-organisms to the cause of human disease. Even so, from 15 to 20 years passed before disease control became definitely organized.

THIRD: Personal hygiene, in which recognition was given to the many forces in the individual which protect him against invasion by organisms. The combination of mass hygiene, disease control and personal hygiene serve as the basis of health conservation.

FOURTH: Health promotion, which refers to those aggressive measures by which the public is taught the need for health preservation. We see this operating in controlled and rational form through health departments and voluntary agencies; in uncontrolled form through the misinformation we get over the radio, through some newspapers and the like.

This evolution of preventive medicine, as applied to the community, has been paralleled very closely in undergraduate education. First, we taught the principles of hygiene, not in a separate "department of hygiene," but simply as an individual subject with emphasis, first on environmental forces, to be succeeded by instruction in the control of infectious diseases. Later came instruction in personal hygiene with emphasis on the resistant forces of the individual.

Despite the fact that all of the preventive principles have been and are being taught, we do not graduate students who realize the opportunities in practicing preventive as well as curative medicine. Why is this? Because, by and large, we have not recognized the passing of the expedient stage of preventive medicine, in which it was considered and taught as a separate subject. Preventive and curative medicine need to be integrated. Furthermore, as Doctor Leathers properly emphasized, they will not be integrated by merely passing on the job to the various college departments. It is of little value to call together the heads or representatives of these departments to discuss the importance of preventive medicine, delegate those phases that are of concern to them and have them go on their way. It must be done through some well supervised methods, as Doctor Leathers says, and that is through a definite, organized department of preventive medicine which should be the controlling and vitalizing factor in the extension of that teaching.

Doctor FitzGerald, in my opinion, brought out the crux of the whole situation when he emphasized the study of health. He said that we must consider the normal man and how to keep him so. How are we going to do this? It will be done in various ways; there is no *one* way. To be sure, at the present time, we do teach the normal man, because the subjects considered in the first and second years, including anatomy, physiology, bacteriology, the preliminaries of obstetrics and the early teachings in pediatrics, all refer to the normal individual. After all, normal pregnancy is a physiological process; equally so is prescribing the proper diet for an infant in order to secure normal growth.

In spite of instruction of this character during the first half of the medical course, the students do not seem to be impressed with the normal human being and come to their clinical years with no definite idea about health as something that must be considered by them. For instance, a subject such as anatomy is recognized by most students as preliminary to their work in surgery and to other clinical work. I should like to see the first two years of the undergraduate course devoted to a correlated study of health. One method of approaching this correlating process is through a committee, with the dean of the college as chairman, those teaching subjects of the first and second years as members, and the head of the department of preventive medicine serving as secretary. By emphasizing health in this way, we might get the students thinking about healthy men and women and the need for preserving their health.

When we come to the clinical years, as has been emphasized by several of the speakers, there is need for the integration of preventive measures with the clinical work. As we know, this is being developed to a greater or lesser degree in most of the medical colleges today through the cooperation of representatives from the department of preventive medicine with the heads of the various clinical departments.

I am glad that stress has been placed on the point that preventive medicine should not be taught as a specialty. We are not teaching our students in undergraduate medical schools, as I understand it, to become public health men. Those who develop an interest in public health should prepare themselves for that field through postgraduate courses.

Doctor Leathers further emphasized that the department of preventive medicine should act as the advisor and consultant and should provide facts and data for the various clinical departments.

At Long Island College of Medicine, similar to the other medical schools in New York City, we have the advantage of one of the Health Department Centers for practical work in preventive medicine. We have a four-week clerkship, such as Doctor Mustard has outlined for his school. The student comes to the clinical clerkship for four weeks after three years of didactic work in the principles of preventive medicine and community health. Because the college viewpoint toward preventive medicine is not as yet completely integrated as it should be, we still have many of the students coming to their

final year with the impression that they are to consider subjects of a public health nature which have no definite relation to them as future practicing physicians. We, as well as the other medical schools, need to place more emphasis on the study of health, the study of the normal being. If we develop that kind of a program, combined with clinical instruction of a cooperative type in the third and fourth years, then our students will come to their final year prepared for practical work in preventive medicine and community health.

At Long Island College of Medicine, the schedule for the four weeks clinical clerkship includes work by the students in the various clinics of the Health Department Center where the college Department of Preventive Medicine has its headquarters. In addition, the students make field visits to various community health activities with which they should be familiar as practicing physicians. Each week conferences are held to discuss informally the activities covered in their relation one to the other and to the entire community health needs. In this way, the students observe and participate in community health methods applied to tuberculosis, venereal diseases, child health, eye conservation, dental hygiene, mental hygiene, industrial health, pneumonia typing, antirabic service, home visits to clinic patrons, laboratory procedures and the like.

The clinic approach to the individual is not emphasized as the students get this training in the clinical departments of the college. Stress is placed on those phases of community medicine which will concern the student as a future practicing physician and in which he must participate. Equipped with knowledge of this kind, the graduate should be able to meet the demands of modern medicine in the community where he decides to locate.

DR. HAROLD S. DIEHL (University of Minnesota): I hesitate to attempt to add anything to this splendid symposium on the teaching of preventive medicine; however, having been concerned for about fifteen years with this subject, I cannot resist emphasizing one or two points which have been made.

One point which I consider of fundamental significance has been referred to by several speakers, that is, the importance of the selection of the personnel to teach preventive medicine and public health. This is one of the most difficult subjects in the medical curriculum to teach effectively. Consequently, we must have superior teachers. We must have men who command the respect of the members of the medical faculties. Unless the scientific achievements, the scholarship and the interests of the men who are teaching preventive medicine hold the respect of their colleagues, we cannot expect that the attitude of the faculty and the student body will be such as to stimulate student interest in this subject.

A second point is that, although we are not trying to train medical students to be health officers, it seems to me a mistake on the part of those institutions which offer graduate work in public health not to have this built on the same department that is offering undergraduate instruction. The graduate medical faculty in most of our institutions is handling and supervising graduate work in various fields, such as pediatrics, medicine, surgery, et cetera. If this graduate faculty has no concern with public health, we can hardly expect that the junior men on the faculties and the students are going to be interested in public health. And if the public health teaching is not considered a responsibility of the medical school and the graduate medical faculty, the attitude that public health work is no particular concern of the physician is bound to permeate the student body.

My third point Dr. FitzGerald has mentioned; that is, that the student health services in our universities offer unique opportunities for practical instruction and demonstration of the practice of preventive medicine to our medical students. During the past two years it has been my privilege to participate in a study of student health activities in this

country for the American Youth Commission. This study revealed that most universities now have organized more or less effective student health services. These departments are attempting to practice preventive medicine, much as we hope the graduates of our medical schools will practice it when they become established in the practice of medicine. If our students observe during their own university experience that our medical schools have no contact with and interest in the activities of the health services, they are bound to deprecate health service programs and we are losing one of the greatest demonstrations we could possibly make to our student bodies of the practical and effective practice of preventive medicine.

Dr. Fred J. Wampler (Medical College of Virginia): I had prepared to discuss Dr. Leathers' paper, but I find that a number of other papers and discussions have covered most of the points; so, I shall now limit myself to two points.

Dr. Leathers has presented a very comprehensive discussion on ways and means for this type of teaching and the coordination of this subject with the other departments in the medical school. The attainment of the ideals set forth in his paper will necessitate increased funds for the department of preventive medicine and public health in our medical schools and a very much enlarged teaching personnel in these departments in most institutions. That the teachers in these departments might be inspired to more enthusiasm and with new ideas, there should be in connection with some of our other national scientific organizations a session, or several sessions, or even a section, devoted to the exchange of opinion among the men teaching preventive medicine in the different schools in America.

From a survey of more than a third of the industries in the State of Virginia, it can conservatively be estimated that the physicians on full time in health work, federal, state and local, together with physicians in industrial positions, constitute about 7 per cent of our medical population. There are still one hundred more men receiving more than 50 per cent of their income from industrial medicine and hygiene, thus bringing the total to more than 10 per cent of the medical population of the state. With this percentage of our physicians going into these specialties and with the need for every physician to be adequately prepared on the fundamentals of prevention, it is disappointing that many medical schools are not giving more instruction in these subjects.

Dr. E. Stanley Ryerson (University of Toronto): It is with considerable elation that I heard the papers read this morning with regard to preventive medicine in the medical curriculum. Dr. FitzGerald referred to the proposal I made at San Francisco with reference to this development and I note with extreme satisfaction that the seed which was planted there is beginning to sprout. One of the first steps with regard to the development of that idea is the recognition by the medical profession of the fact that health is something positive in the same way as disease is a positive state of the human body. In the past, the whole of medical education has been so focused on disease and the training of men to look after sick people, that the doctor has never really thought very much about individual health and health as a state of existence of the individual human being. If this problem of health is to be integrated into the medical curriculum at its early part, it should be from the standpoint of individual health, in which a correlation of all of the subjects of the two first years, with the exception of pathology, can be brought about and give the student a knowledge of the human being in a state of health.

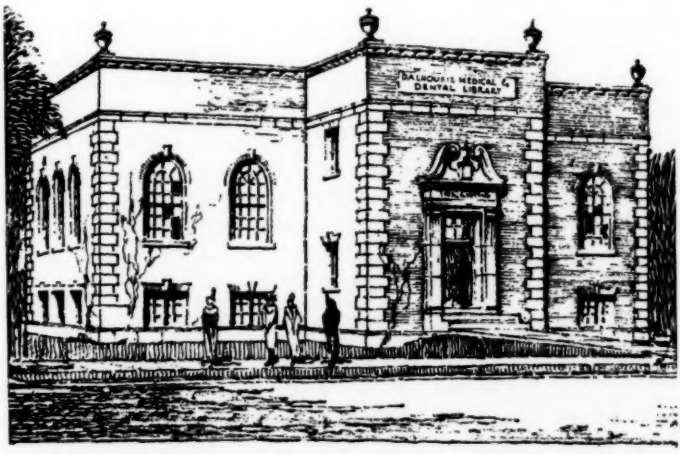
Nobody needs a knowledge of health more than the general public. There is an extraordinary movement of health consciousness coming about in the public at present, and the problem is for the medical profession to study how that education in health for the public is going to be made accurate and scientific. I do not see why, say, twenty-five years from now, medical men, trained in health in the early part of their medical

course, might not be qualified to teach health to the public. Not only that, but supposing a group of students go on to the end of their first two years of the medical course and have a knowledge of health, then decide not to go on with the medical course and become doctors; such men would be extraordinarily valuable in the problem of developing health education.

At the present time, health education is a matter of the elementary school, when the child is too young to be given anything of scientific value. If we had qualified men to continue health instruction through the secondary school level and give every individual in the country a knowledge of the human being, how it is formed and how it works, then people would be in much better position to direct their own health, which is the individual responsibility of everybody, and know when to consult someone when he finds that he is in difficulty.

Health education might still further be continued to the university level. We could have many medical students taking a course in human science and health, who would fulfill a very big gap that exists at present in general education.

I am glad that this evidence of interest in health has arisen. I hope that, in the not too distant future, the subject on the program will be "The Place of Health in the Medical Curriculum," and follow up this idea of preventive medicine in that way.




New Library Building of Dalhousie University Faculty of Medicine.

# Use of the Polyelectrophysiograph in Teaching Medical Physiology at the University of Colorado School of Medicine

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The polyelectrophysiograph is an instrument which we have constructed for the purpose of demonstrating the various electrical, sound and auditory phenomena which are customarily considered in the regular physiology course given the medical students at the University of Colorado School of Medicine. A demonstration of the instrument together with some of its uses was made at the Federation of American Societies for Experimental Biology held in Washington, D. C., April 1936 (Huddleston, Whitehead and Moritz[1]). In general, the machine is composed of the following parts: two cathode ray tubes arranged in parallel with a commercial A.C. operated cathode ray oscillograph unit, a battery operated high gain amplifier, a power amplifier which operates a dynamic loud speaker, standardizing equipment containing a microvoltmeter and millivoltmeter, regular inputs of the oscillograph unit together with three additional inputs which lead into the high gain amplifier, telephone plug patch cords, switch board jacks associated with various control switches and selector switches, a contact microphone and audio crystal cardiophone. All the above mentioned equipment except for the input terminals, microphone and loud speaker are arranged in four compartments and mounted on regulation telephone racks which rests upon castors making the entire unit portable. The base of the frame forms a platform upon which are arranged the A and B batteries which supply the high gain amplifier. Figure 1 illustrates the general arrangement of these units which compose the polyelectrophysiograph.

## GENERAL DESCRIPTION OF THE INSTRUMENT

Situated at the top of the instrument is seen two cathode ray oscillograph tubes together with the control switches which are used to operate the various circuits of the oscillograph unit. Two types of cathode ray tubes are employed, the only significant difference between the two is the composition of the respective screen phosphors. One of the tubes, indicated at "A," possesses a screen which emits both fluorescent and phosphorescent light when activated by the electrons from the cathode ray gun and is useful therefore, for the demonstration of transient low frequency electrical phenomena. The other cathode ray tubes, shown at "B," possesses a screen composed of a phosphor which when activated emits fluorescent blue light of high photoactivity making it especially suitable for recording purposes. A selector switch, located at "C," enables an

1. Huddleston, O. L., Whitehead, R. W., Moritz, B. E.: Am. J. Physiol. 116: 81, 1936.

operator to feed the impulses into the slow screen tube "A" or the fast screen tube "B." Either of these tubes may be operated by the manual sweep switch shown at "D" or by the sawtooth sweep circuit operated by switch "E."

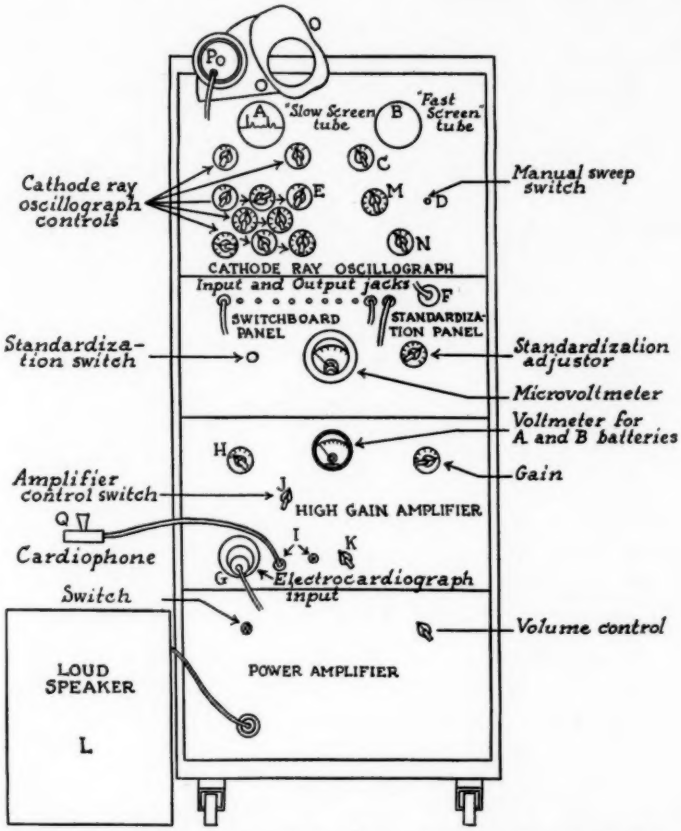


FIG. 1. A: Slow Screen Tube. B: Fast Screen Tube. C: Cathode-ray Tube Selector Switch. D: Manual Sweep Switch. E: Sawtooth Sweep Switch. F: 6 Volt D.C. Plug Jack. G: Electrocardiograph Input. H: Electrocardiograph Lead Selector Switch. I: Input Jacks for Microphone and Miscellaneous Electrodes. J: Selector Switch for Stage of Amplification. K: Variable Resistor Control. L: Loud Speaker. M: Fine Adjustment Control for Sweep Velocity. N: Coarse Adjustment Control for Sweep Velocity. O: Viewing Shield. P: Light Source which supplies Red Light for Erasing Phosphorescent Traces from Slow Screen Tube. Q: Cardiophone (Crystal Microphone).

When it is desirable to make a permanent record of some electrical phenomena, the switch "C" is set in the central position which focuses the electron beam in the center of the fast screen tube. With the switch set in this position, the amplified electrical impulses are fed into the vertical deflecting plates and

the spot oscillates in the vertical meridian. By moving a highly sensitive film of a camera horizontally, the oscillations of the electron beam may be recorded very satisfactorily as a continuous photographic tracing. A more detailed description of the construction and operation of the cathode ray tubes may be found in an article which is to be published soon by Huddleston and Whitehead.[2]

Located immediately below the compartment containing the cathode ray oscillograph elements is another shielded compartment which contains the standardizing equipment and the input and output telephone jacks which enable one to make various electrical connections by means of telephone plug connectors or patch cords. The standardizing equipment enables one to introduce into the high gain amplifier electrical currents of known voltage ranging from one microvolt to 50 millivolts. The plug jack "F" is a six-volt D.C. output which may be used as a supply source for any equipment requiring a low voltage D.C. current. Below this compartment is situated another containing the battery operated high gain resistance coupled amplifier, voltmeter for the "A" and "B" batteries, selector switch, output control switch of the amplifier and input terminals. The input shown at "G" is used for connecting the machine to suitable electrodes for recording electrocardiograms. The switch "H" located immediately above is the lead selector switch which controls the connections for this input. The two jacks, "I" to the rght of this electrocardiograph input are also inputs which feed into either the first or second stage of the amplifier. The selection of the stage of the amplifier into which the electrical currents are to be introduced may be accomplished by operating the selector switch "J." The jack on the right is connected in series with a variable resistor which is operated by control "K."

It is apparent that the switches located above and to the right of the input jacks are used to determine the number of stages of amplification and to regulate the intensity of the input which is fed into the high gain amplifier. Electric currents of small voltage from any source (physical, chemical or bioelectrical) may be fed into these input jacks of the high gain amplifier and thence into the cathode ray oscillograph element, or into the power amplifier contained in the compartment below. The power amplifier compartment located in the bottom of the instrument shows an on and off toggle switch, a volume control and an output jack for the dynamic speaker. The input jacks shown in the high gain amplifier compartment are used for standardization of the sensitivity of the instrument and for demonstrating sounds and auditory phenomena which may be picked up by crystal microphones.

The loud speaker shown at "L" is operated by the power amplifier which may be connected to the high gain amplifier. Various sound phenomena covering the entire auditory range may be heard separately or in combination with the visualization of the waves on either cathode ray tube.

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2. Review of Scientific Instruments, 1988.

GENERAL USES OF THE POLYELECTROPHYSIOGRAPH

The utility of the oscillograph unit as an electrical testing device has been maintained. Electric currents of sufficient voltage may be fed into the vertical deflecting plates of either cathode ray tube and the oscillations observed on either screen. The wave form and oscillation frequency may be examined by using either the sawtooth sweep circuit or the manual sweep circuit. The sweep velocity of the latter is determined by adjusting the proper condenser capacity which is controlled by the switches indicated at "M" and "N." As a testing instrument, it may be used as an A.C. peak voltmeter or an A.C. or D.C. ammeter. In addition to its use as a meter, it may be used as an oscillograph in radio work for the measurement of the audiofrequencies and audioquality; it is useful also as a modulation indicator and for checking phase shifts, etc.

The standardizing equipment may be used in connection with the high gain amplifier to calibrate the deflections of the cathode ray beams so that records photographed from the screen of the fast tube may be analyzed quantatively. This feature of the instrument is especially useful in connection with the measurement of small electrical currents which may be picked up from various kinds of tissues by means of suitable nonpolarizable electrodes and fed into the high gain amplifier through one of the appropriate inputs. With this general organization of the machine, it becomes apparent that it is possible to reproduce the wave form of any action current derived from muscle, nerve or gland tissue regardless of the oscillation frequency. Likewise, the electromotive force of these small electrical currents may also be measured quite accurately.

The visualization of these bioelectric currents on the screen of the slow tube or fast tube using either the sawtooth or manual sweep circuit is very instructive. Also, when desired, a permanent photographic record of any action current may be made. Thus, records made of various kinds of bioelectric currents may be recorded at any time and demonstrated to the entire class in the lecture room. Examples of these photographic tracings, such as the electrocardiogram, electromyogram, electroneurogram and the electroencephalogram, have been recorded and are demonstrated to the class. These are exhibited first in the lecture room and later are posted in the laboratory so that students may examine them during the course of their laboratory work.

With respect to auditory phenomena, sound waves from any vibrating material may be picked up by the use of either a contact crystal microphone or a cardiophone and fed into the high gain amplifier. The selection of the approprite input jack will be determined by the relative intensity of the currents which are picked up. Currents of relatively low voltage are fed into the first stage, whereas those of higher voltage, resulting from sounds of larger intensity, are fed into the second stage of the amplifier. The amplified oscillations may be fed into either cathode ray tube in order to determine their frequency or to visualize their wave form. Also those sound waves may be made audible by feeding them into the power amplifier and loud speaker system. Thus, with this setup it is possible to see or to hear, either separately or simultaneously, any

sound wave throughout the entire auditory range. Likewise, with the combined usage of the cathode ray oscillograph and loud speaker system, demonstrations of vibratory frequencies below the auditory range as well as those within the supersonic range may be made.

### CLASS ROOM DEMONSTRATION

The polyelectrophysiograph is a most useful instrument for demonstrating various electrical and bioelectrical phenomena. Various kinds of electrical currents which appear to mystify freshmen medical students even though they have been grounded in the fundamentals of electricity in the physics courses taken in the college or university. Since it is necessary for students to employ various kinds of electrical currents during the course of their laboratory work in physiology, it is believed that a much better understanding of electrical phenomena is obtained when these various stimulating currents are demonstrated with the cathode ray oscillograph. When these currents are fed into the vertical deflecting plates of the cathode ray oscillograph, it is possible for students to observe the deflections of the cathode ray beam on either the slow or the fast screen tube. Uninterrupted and nonoscillating deflections of the beam are shown by galvanic or direct currents of various intensity. Direct currents supplied by batteries of various kinds, by a motor generator, or by a rectifier are introduced and allowed to flow continuously for varying periods of time or they may be interrupted intermittently at various frequencies, thus demonstrating the changes in potential resulting from opening and closing a circuit conducting a D.C. or galvanic current. One is able to demonstrate make and break stimuli with galvanic currents which are employed in some of their experiments. Likewise, sixty cycle A.C. currents, slow and rapid sinusoidal currents, interrupted galvanic or faradic currents, or various combinations of these currents, such as are delivered by a Morse wave generator or similar commercial multiwave generators, may be exhibited.

In connection with induced currents, it has been my experience that it is difficult to make some beginning students realize that an electrical current is induced into the secondary circuit only on opening and closing the key of the primary circuit of an inductorium, and that no induced current is present when the galvanic current is flowing continuously in the primary circuit. These features are illustrated very satisfactorily by means of the polyelectrophysiograph. It is possible, also, to measure the voltage and demonstrate the wave form of the induced make and break shocks delivered by an inductorium. With the secondary coil set at different distances from the primary, the relative difference in voltage of make and break shocks in the secondary circuit is exhibited graphically. These features of induced currents, i.e., their interrupted nature, variations in the rate of change in potential shown by the wave form and, the difference in the electromotive force present in the make and break shocks, are portrayed very clearly by sweeping the amplified impulses across the screen of the slow tube by means of the manual sweep. Furthermore, the reason for the greater effectiveness of the break shock when applied to nerve-muscle prepara-

tions becomes strikingly apparent. Using a similar setup and adjusting the velocity of the manual sweep properly the interrupted induced currents caused by the oscillations of the vibrator of the inductorium when the faradic current is employed are shown quite impressively. Condensor discharges from a neon tube oscillator or a Thyratron stimulator also provide an impressive exhibition of stimulating currents of this type.

Bioelectric currents of various kinds such as action currents from nerve or muscle tissue may be viewed on either tube. On the "slow screen" tube they are seen as standing waves and on the "fast screen" tube as transient waves. Since the interval between successive waves of action currents is quite irregular, it is practically impossible to synchronize the sawtooth sweep circuit with these irregular frequencies; therefore, standing waves cannot be obtained satisfactorily with this procedure. However, when desired, a permanent record of some of these currents may be photographed. Currents from isolated nerves and muscles or from intact muscles of experimental animals or from the muscles of students are easily shown. Their approximate frequency may be ascertained by means of the sawtooth sweep circuit of the cathoderay oscillograph or they may be measured accurately on recorded photographic tracings.

A rough idea of their frequency may also be ascertained by connecting these amplified currents to the power amplifier and loud speaker in order to make the vibrations audible. Then, by comparing the pitch produced by these vibrations to known frequencies delivered by tuning forks, an audiometer or a beat frequency oscillator, one is able to estimate roughly the oscillation frequency of the bioelectric currents. The characteristics of monophasic and diphasic currents are readily exhibited and the distinction between action currents and demarkation currents is easily shown. When suitable electrodes are applied to the scalp and the electrical currents fed into the high gain amplifier and thence into the cathoderay oscillograph, the electrical currents emitted by the brain under various experimental condition may be exhibited. The electroencephalograms traced on the slow screen tube or photographed on film show the typical Berger waves which are considered in connection with the physiology of the cerebrum.

In the study of the cardiovascular system, electrocardiograms are traced repeatedly on the "slow screen" tube from any one of the three or four conventional leads. The amplitude of the waves may be adjusted to suit the conditions of the demonstration and the velocity of the sweep may be altered so that the successive cardiac cycles may be spaced closely together or they may be spread out considerably and the cycles widely spaced. Conventional electrocardiograms may be recorded from the "fast screen" tube or the waves constituting the electrocardiograms may be amplified and the film speed increased in order to reveal other minor wave components which do not appear in the ordinary electrocardiogram. Comparative electrocardiograms recorded from laboratory animals such as dogs, cats, rabbits, rats, mice and pigeons are mounted as an exhibit and

placed on one of the bulletin boards of the laboratory so that students may observe and study them.

Typical examples of various cardiac arrhythmias and of various diseased conditions of the heart, recorded from patients in the Colorado General Hospital, are likewise exhibited in the laboratory. By the use of either a contact microphone or a crystal cardiophone, the heart tones of students are demonstrated to the class. Heart murmurs of various kinds exhibited by hospital or dispensary patients are also demonstrated. The instrument is especially useful in determining the position of a heart murmur in the cardiac cycle by referring the amplified audible murmur to the electrocardiogram which is traced on the screen of the slow tube simultaneously. Action currents transmitted by afferent and efferent nerves involved in cardiovascular reflexes likewise may be shown. A very instructive application of this experimental procedure is the demonstration of action currents concerned in cardiac reflexes, such as the aortic and the Bainbridge reflex. In connection with the use of the sphygmonanometer the five auscultatory phases involved in the application of the Karotkow method of determining blood pressure are easily taught.

With regard to respiration, breath sounds which may be detected by auscultation and the distribution of such sounds in the normal chest are demonstrated to the class. Later on, a few abnormalities of breath sounds such as exaggerated bronchial breathing or adventitious sounds such as rales, friction rubs, etc., are reproduced when suitable clinical cases are available. Action currents associated with respiration which may be picked up from the vagus or phrenic nerves and the alteration of these currents under various experimental conditions may be shown.

As yet no attempts have been made to exhibit action currents associated with smooth muscle viscera of the gastro-intestinal tract, genito-urinary tract, excretory and incretory glands or of the automatic nerves that supply these structures, but I have no doubt that some of the bioelectric phenomena associated with the tissues composing such viscera might be portrayed. In due time, attempts to demonstrate these phenomena no doubt will be made. Judging from the results secured from tissues of other organs as well as from reports in the literature made by observers using somewhat similar oscillographic equipment, it is quite likely that successful results may be obtained.

The study of the special senses is enhanced by the use of our instrument. In connection with the study of the ear and associated auditory phenomena it is very easy to demonstrate pitch, loudness and timber of sounds by means of the audio system. By combining the audible sound properties with the visualization of the waves on the tubes of the cathoderay oscillograph it is possible to correlate these physiological phenomena of sound with the physical attributes of sound waves such as frequency, amplitude and wave form. The relationship of fundamental waves to various harmonics and their causal influence on pitch and

timber becomes apparent. Action currents from the cochlea or auditory nerve may be picked up by means of suitable electrodes and fed into the machine in order to demonstrate the Weaver-Bray phenomenon.

In the study of the eye, the electrical currents from the optic nerve resulting from mechanical or photostimulation of the retina may be exhibited. Owing to a few technical difficulties, the demonstrations dealing with the action currents concerning special senses have not been entirely satisfactory but it is believed that these may be overcome so that they may be successfully performed for the physiology class this fall.

It is quite apparent that the unusual versatility and adaptibility of the polyelectrophysiograph for the detection, amplification and visualization of any electrical current over a very wide voltage and frequency range regardless of whether it be of physical, chemical or of biological origin makes it an extremely useful instrument for demonstration purposes in teaching physiology to freshmen and sophomore medical students. Furthermore, the fact that any of the electrical oscillations may be observed, photographed or heard either separately or in combination further enhances its usefulness as an instrument for teaching purposes.

# Teaching of Biochemistry to Medical Students

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Professor of Biochemistry, School of Medicine, Tulane University of Louisiana, New Orleans, Louisiana

At the Tulane University School of Medicine the teaching of biochemistry has developed away from the commonly accepted methods. In our judgment, the results have seemed to justify these departures from the traditional methods.

The central aim has been that of teaching a large class (100 to 120 students) in small groups, and this is carried out in both the didactic and practical work of the course.

In the didactic work, teaching is almost exclusively by the conference method. A group of six students meets with one of the instructors twice a week for two 45 minute conferences. At these conferences the students discuss a textbook assignment posted previously, and "previewed[1]" before the whole class. At the conference the instructor determines the scope of the discussion and keeps debate lively and interesting by provocative suggestions, but keeps out of the discussion as much as possible. When the schedule permits, these discussions sometimes extend beyond the allotted time, and carry over into the laboratory period. Each student has one conference on the use of the library.

On Saturday morning, one of the senior members of the staff meets the entire class to unify and integrate the work of the week and discuss the historical aspect of the subjects taken up that week. The subject matter is discussed in its broad and general aspects, and the student's familiarity with the material enables him to listen critically without the desperate rush of note taking that goes with a lecture on an unfamiliar subject.

One of the features of the Saturday review lecture is the giving of literature reports by the students, and this frequently occupies one-third or one-half of the hour. Student reports are handled as follows: A report represents a review by the student of a current article in the clinical literature dealing with the subject under discussion for the week. When fat metabolism is under discussion, one of the reports will be on a current clinical experimental study on the bactericidal effects of beta-hydroxybutyric acid excreted in the urine. The student speaks before the class extemporaneously from notes, and at the conclusion of the report holds the floor for discussion, criticism and questions by the members of the class. The assignment reported on has been posted on the bulletin board for some time, and some students go to the trouble of reading some of them and enter into the discussion with some knowledge of the subject matter of the article. The instructor in charge directs the discussion into profitable channels and suggests the pertinence of the biochemistry involved. We think that the teaching value of this type of discussion is very great.

1. The assignments for the conferences of a given week are discussed before the whole class on the preceding Friday, with the aim of directing the emphasis to be placed on different portions of the assignments.

There are periodic written examinations of the objective type. Each student writes a thesis for either the department of biochemistry or the department of physiology.

The laboratory work of the course is unconventional in that no certain amount of work is required of any student. He works at his own speed and does not go to another experiment until the one in hand has been done to his own satisfaction.

As an example of this method, he does the Kjeldahl determination of nitrogen in the following way: The general principles of the method are outlined to him in a laboratory conference. In the laboratory he is furnished with a solution labeled with its known nitrogen content, and he practices the method until he is able to recover the nitrogen from it. He now receives an unknown solution, and when he has handed in a report that is acceptable, he goes on record as being ready for an examination on that aspect of the work. Students are, therefore, examined when they state that they are ready for an examination, and on a practical examination they are given only those determinations that they have completed to their own satisfaction. Emphasis is thus put on the quality rather than the quantity of work done, with the idea that a few things well done are worth more to him than the completion of a certain number of procedures in a required time.

The competitive spirit is strong in medical students, and this is utilized in the publication of score sheets indicating the excellence of performance in the laboratory work. When a certain determination has been finished by the entire class, lists are published showing who received first, second and third rating in accuracy.

The main feature of the laboratory work is that of the special projects. At the beginning of the course all students are assigned in groups to special projects which range from the production of vitamin deficiencies in white rats to a study of the accumulation of nitrogen in the blood of nephrectomized rats. Each project is under the supervision of a certain instructor who guides the student in his reading of the literature before the work is started and in planning the work. Some of these projects serve as excellent demonstrations before the whole class and are carried out entirely by the student group. Students working on a particular project present the work to the entire class, and this results in a really considerable amount of self-teaching.

Where the nature of the work is such as to require it, the participation in work of special projects diverts the student from the regular work available to the whole class, and this is felt to be a gain, because his interest in the work results in extra work being done, and the routine work offered in the laboratory is covered either as a part of the necessary preparation for the project or in extra time devoted to the course.

Another departure from the conventional method is the way in which the practical examinations are conducted. Nothing is memorized for the practical examination. Students are encouraged to bring the laboratory guide, textbooks

and any other notes from experiments that will help them, and the laboratory examination is thus a test of their ability to carry out a procedure from directions rather than a memory test.

No attendance records are kept, and our problem is not so much to see that the student stays in the laboratory until 4 o'clock as it is to get him out at 6 o'clock when the laboratory must be closed.

Memorizing is cut to the absolute minimum. No single formula must be memorized. The old habit of having the student memorize all twenty or more amino acids does not exist, but students are required to know the significant groups that occur in many biologically important substances.

At a little more than half way through the course, there is a competitive oral examination. The ten highest ranking students in a recent examination appear for the competitive oral examination. It is conducted in the form of a "spell down." Members of the staff alternate in framing oral questions to be answered by the ten candidates. A correct answer enables the student to stay in, and a wrong answer eliminates him. The last two students to survive are given presents of books, and the final survivor has his name engraved on a silver cup trophy which remains with the department and has on it the names of all preceding winners. This competition is entered into with great zest, and serves as an excellent review for the remainder of the class which is present.

Near the end of the course, there is a debate. The class chooses two groups of four debaters to thresh out some question, such as the necessity of copper in hemoglobin regeneration or the question as to whether the insulin requirement is related to carbohydrate metabolism alone or the total metabolism.

In general, it may be said that what we are doing is to substitute for formal lectures and quizzes and memory feats the alternative method of informal group discussions, self-teaching and emphasis on the biochemistry involved in the practice of medicine.

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### *Semicentennial Meeting, 1939 Association of American Medical Colleges*

October 23-25, the Association of American Medical Colleges will hold its semicentennial meeting in Cincinnati. For fifty years the Association will have contributed nobly to the advancement of medical education, undergraduate and graduate. A perusal of its activities as set forth in the proceedings and/or transactions of the annual meetings prior to 1926, the date of the establishment of the BULLETIN, now the JOURNAL of the Association, gives evidence that much has been accomplished in the effort to bring about change and improvement. During the years many notable figures in medicine and medical education have taken a very active part in the activities of the Association. Such men as Biddle, Bodine, Osler, Welch, Thayer, Williams, N. S. Davis, Emerson, Vaughn, Bardeen, Rodman, Witherspoon and many others proposed and brought into being many of the advances in the curriculum, in teaching, in better preparation for the study of medicine. Furthermore, reading these reports speedily convinces the reader that "there is nothing new under the sun." The same problems are with us today as were the subject of discussion fifty years ago. What was proposed then, and not all of it came to fruition, is still being proposed. And, doubtless, always will be because with changing times, other factors touching on these problems call for consideration and defer definite action. Nevertheless, medical educators of today are alive to what their needs are; what changes should be made, even how they should be made; and when the proper time comes, they will be made.

Therefore, the fiftieth annual meeting of the Association should be a special reason for celebration. For fifty years the medical colleges have worked together to attain an objective working unobtrusively, without fanfare of trumpets. Each year fulfillment is a little nearer, but still just beyond reach. Some of the colleges now in membership have enjoyed this association for the entire fifty years. One school (Johns Hopkins) was represented in the call for organization by the staff of its hospital before the medical school had come into being. These men were convinced of the need of a medical college association to set greatly desired standards for the guidance of medical education: to lengthen the course; to set up a graded curriculum; to lay down standards for admission to medical schools. Many of these men lived long enough to see some of these aims materialize. Their successors have carried on with the same spirit. Harmony, good fellowship, friendship, like aims, like ambitions—all have contributed to the progress made by the Association in its striving for advancement in its field of activity.

Again, therefore, the fiftieth annual meeting should be a particularly fine meeting, with every member college represented by one or more delegates. Make plans now to be in Cincinnati, October 23-25, 1939.

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### *Scandinavian American Foundation*

The Scandinavian American Foundation of Stockholm, Sweden, is very much interested in making possible an exchange of medical students between Scandinavian countries and the United

States. It has selected the Association of American Medical Colleges as the agency in the United States to cooperate in this plan. The feasibility and workability of student exchange, as well as teacher exchange, between the United States and foreign countries has been confirmed by the achievements of the Institute of International Education in the field of general education. Why should not student exchanges be as beneficial in the field of medicine as they have been in other fields of learning?

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*The Doctor in the U. S. Navy*

Under University of California Medical School news will be found an interesting report sent in by four graduates who are members of the Medical Corps of the U. S. Navy. These notes give a fine exposition of the opportunities these doctors have to perfect their skills in any or all fields of medical practice, including the care of women and children. Skill, fitness, ingeniousness, self-reliance and competency are essentials in making this type of service a successful career. It offers excellent opportunities for the right man.

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*Dr. Rappleye's Conference*

Dr. W. C. Rappleye, president of the Association of American Medical Colleges, has called a meeting of representatives of various national organizations to consider the formation of a National Council on Medical Education, Licensure and Hospitals. The meeting will be held in the Palmer House, Chicago, February 11, 1939, at 10:30 A.M.

This movement was initiated by Dr. Rappleye and approved by the Association of American Medical Colleges at its meeting in Syracuse, October 25, 1938.

Dr. Rappleye was authorized to call the meeting. Dr. Rappleye, Dr. Maurice H. Rees and Dr. Wm. S. Middleton were appointed by the Executive Council to represent the Association of American Medical Colleges at the meeting.

*Trends in Graduate Medical Education*

Many medical schools are feeling the pressure resulting from the demands of physicians for graduate medical work. The regulations for membership set up by twelve or thirteen national medical specialties associations are forcing prospective members to seek opportunities which provide graduate study which will meet these requirements. The work of the various specialty boards of examiners is most commendable. It is definitely a step in the right direction. Eventually, the public will be assured of being able to secure real special service from men who have been certified as being qualified by these boards. Therefore, any assistance which medical schools can give to the men who seek these qualifications should be made available.

For the medical schools, however, this development has raised some very serious problems. First of these is that the facilities for giving this work are not sufficiently developed to make it possible to extend the privilege of graduate study to more than a few applicants. Naturally, undergraduate students must be served first, which leaves little for graduates. Second, lack of sufficient funds makes it virtually impossible to provide further facilities, personnel, etc., to meet the demand. If these graduate students can and will defray the whole cost of what is needed to give them full opportunities for study, well and good. But, how many of them can do this? It is well known that the cost per undergraduate student to the school is from three to five times greater than the fees he pays. To meet this cost, the graduate should pay from $1,000 to $1,800 per year in fees. Can he do it?

Not only the preclinical but the clinical departments are being hard put to it in some schools to provide opportunities for graduate study. Not all of these students intend to qualify for a special medical practice. Some of them are preparing to teach, especially in preclinical subjects. The magnitude of the

problem is illustrated well by what is happening in one state university medical school. For the academic year 1938-1939, 239 graduates have enrolled for special study—86 of these in clinical subjects or fields. Of the total number, 64 are working for the Ph.D. in preclinical and clinical subjects; 102 seek a master's degree. The remaining 73 students seek a minor degree. Surgery has 13 candidates; medicine, 12; obstetrics and gynecology, 7; pediatrics, 6; preventive medicine and public health, 23; radiology, 9; ophthalmology and otolaryngology, 13.

The question at issue at the moment is: How can this problem be solved? Solved it must be because the fine work of the specialty boards must be supported. The public must have well qualified specialists in the various fields of medical practice. Medical schools are in need of adequately trained teachers in the preclinical fields and the demand for these is becoming greater all the time. There are many more positions open than there are men to fill them. Who should pay the cost? Should the candidate pay? Should the state pay? Are endowments sufficiently income producing to stand the strain of this extra demand? How can medical schools get a sufficient number of adequately trained teachers to carry on in graduate work so that the requirements of the specialty boards can be met properly and adequately? These questions must be answered quickly because the number of applicants for graduate work is increasing rapidly.

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*Americans Studying Medicine in Great Britain*

Despite the fact that the General Medical Council is cooperating with the Association of American Medical Colleges in the evaluation of credentials of Americans who seek admission to one of the medical schools of Great Britain, there are now many such students in the so-called extramural schools of Scotland. Any student who does not wish to be enrolled in the Medical Students Register of Great Britain does not need to submit his credentials to the General Medical Council, nor do these schools need to work through the Council in the matter of admitting students. This accounts for the large number of Americans now enrolled in these schools. For example, word has been received that at St. Mungo's 236 Americans are enrolled —92 in one class!

According to the ruling made by the Federation of State Medical Boards, the National Board of Medical Examiners, the Council on Medical Education and this Association, the return of Americans who have studied medicine in a foreign school to this country for practice is surrounded by demands which must be met. The question arises: How is it possible that so many Americans are still enrolled in foreign schools, students who anticipate returning to the United States to practice? In 1938, the credentials of only 14 American students were sent to the office of the Association of American Medical Colleges for evaluation. Apparently, the extramural medical schools of Great Britain (Scotland) are not cooperating in the movement mentioned above. Returning to this country, these students must serve an internship to which they cannot be admitted by an approved hospital unless they have passed Parts I and II of the National Board. And the state licensing boards, at least many of them, do not accept an internship in a nonapproved hospital as meeting their requirements. Several states now require citizenship but that does not affect these returning Americans. The scholastic record of many of these students is not good; in fact, many of them have been refused admission by one or more of our own medical schools. We refuse to accept them, but they return from abroad with the M.D. degree and expect to enter a profession which our schools felt should be denied them for good and sufficient reason. Something should be done about this. Where is the leak?

# College News

*University of California*
*Medical School*

Several graduates of the Medical School are in the Medical Corps of the United States Navy. Four of these have sent accounts of their work and experiences. Charles F. Flower, M.D., 1926, United States Naval Hospital, Canacao, Philippine Islands, has written:

"I, with twelve years in the Navy Medical Corps, have just been selected to the rank of Lieutenant Commander. I came out to the Asiatic Station in August, 1937 with the Sixth Regiment of Marines landing in Shanghai on September 19 in the midst of the Japanese-Chinese incident and served with the Second Marine Brigade until the Sixth left for home in February 1938 at which time I was transferred to the Fourth Regiment for duty. In May 1938, I was again transferred, this time to the Naval Hospital at Canacao, P. I., where I am at present in charge of Eye, Ear, Nose and Throat Department. During the period in Shanghai, China, I witnessed, at close range, the fighting taking place on all sides and saw something of the medical attention both Chinese and Japanese wounded received. Needless to say, the Japanese were better prepared in this work than the Chinese, just as they were in their military operations. We, in the Navy Medical Corps, have for our patients mainly men in a limited age group and so our practice differs materially from that engaged in by private practitioners. However, some of us are employed in treating Navy dependents and this work is similar in many respects to that which is performed by the private practitioner with much obstetrics and pediatrics. Opportunity is generously afforded the individual in the Navy Medical Corps to pursue a specialty and to receive a post graduate training. Whenever the doctor is assigned to hospital duty, which is frequently, he then has the chance to practice his specialty. At other times, when aboard ship, for instance, or on expeditionary duty, he is called upon to perform all sorts of duties, including treatment of injuries and illnesses, inspection of food, sanitation, etc. When on foreign duty, there is ample opportunity to visit the medical institutions of the country and observe the work being done by foreign medical men. Much information is thus derived regarding so called "tropical diseases," such as kala azar, typhoid, malaria, amoebic dysentery, leprosy, etc. I was particularly interested in seeing hundreds of cases of trachoma in China, as well as numerous cases of avitaminosis (particularly vitamin A deficiency) that occurred mainly in two classes of individuals—the soldiers and the young apprentices. One year more of duty out here remains and then I shall return to the United States to take up my duties in one of the Naval Hospitals."

From Courtney G. Clegg, M.D., 1928, United States Naval Hospital, Brooklyn, New York, the following letter was received:

"After completing the internship at the United States Naval Hospital, San Diego, in 1928, I spent two years as Junior Medical Officer on a battleship, the U. S. S. Tennessee. The next two years, until 1934, were spent on the surgical service at the U. S. Naval Hospital, Mare Island, California. Then I was sent to China for two years, serving about a year with the Yangtze Patrol and a year with the Fourth Regiment of Marines in Shanghai. Since my return to the United States in 1936, I have been on duty on the surgical service at the Naval Hospital in Brooklyn. This rotation of duty is more or less typical for all Naval Medical Officers, and comprises the real difference between work in the Navy and the usual

civilian practice. Features that make the Navy especially satisfactory from the doctor's viewpoint are our unlimited facilities for investigation and treatment of patients, regardless of their financial situation, and the high degree of cooperation, teamwork, and *esprit de corps* among the Medical officers."

From Morris M. Rubin, M.D., 1932, U. S. S. Winslow, Temporary Flagship, United States Navy, San Diego, California:

"Upon entry, I reported for duty at the United States Naval Hospital, San Diego, California, where I completed my internship on a rotation type of service, which included surgery, medicine, genito-urinary service, x-ray, out-patient service, gynecology and obstetrics. In addition, we received bi-weekly lectures on purely military subjects so that we would not be too "green" upon being transferred to one of the ships of the Fleet. After nearly two years at the hospital, I was transferred to the Naval Dispensary at Long Beach, California, which cares primarily for dependents of naval officers and enlisted men in the Long Beach-San Pedro area. At Long Beach, my work was limited to caring for women and children and included the practice of gynecology, obstetrics and pediatrics. I mention this because it may seem strange to people outside of the Navy that Navy doctors do very frequently care for women and children in their practice. Great care is exercised by the Navy in limiting this out-patient service strictly to true Navy dependents. Hospitalization of these patients, when necessary, is arranged for at civilian hospitals, and is paid for by the patients. Medical service is given by the naval doctors. Some naval hospitals now have a ward set aside for hospitalization of dependents and here again hospitalization is paid for by the patients themselves. Following this duty, I spend some time on temporary detached duty with the U. S. Army as a District Surgeon of a group of C.C.C. camps where camp sanitation was our major problem and where the field of preventive medicine was the primary consideration. Early in 1936, I reported for duty aboard the aircraft carrier, U. S. S. Saratoga, which normally carries three or four physicians and two dentists. Nearly two thousand men are aboard a ship of this type and the medical practice is varied accordingly. General surgery, including traumatic surgery, medicine and genito-urinary cases are cared for aboard this ship. Cases which require longer periods of hospitalization are transferred to the hospital ship, U. S. S. Relief. The Relief is a large, fully equipped floating hospital which is staffed by a group of medical officers, each one a specialist in his particular field, as well as a staff of twelve female naval nurses, and a large number of hospital corpsmen. The Relief accompanies the Fleet on all large scale maneuvers and is available for the care of Naval personnel at all times. To round out my tour of sea duty, I was transferred in March of this year, to a small ship, the U. S. S. Winslow, where the type of medical duties is quite different from those on a large ship such as the Saratoga. As the division medical officer, on a division of destroyers, a doctor is responsible for the health and sanitation of the men and officers on four ships in his division. Each ship carries about two hundred men and due to the small size of the ship, living quarters are somewhat crowded and the role of sanitation and preventive medicine is paramount. After spending two years on a tour of sea duty, a doctor is then transferred to a three year tour of shore duty at a hospital or Naval dispensary where he has an opportunity to practice his particular specialty. Following this tour of shore duty he becomes eligible for transfer to a two year tour of foreign shore duty at Manila, Guam, Samoa, or other outlying Naval Station. On this duty, as on shore duty in the States, the doctor may have his family with him, and then return to the mainland for a three year tour of shore duty before going back to sea duty. In this way, one is able to have the benefits of

varied medical experiences as well as the satisfaction of travel during the years of active practice. From time to time, while a medical officer is on shore duty, he may be sent for post-graduate instruction to the Naval Medical School at Washington, D. C., or to civilian institutions in various parts of the country."

And from Walter R. Miller, M.D., 1937, U. S. S. Melville, San Diego, California:

"Arriving in Washington about September 1, 1937, and reporting to the Naval Medical School for post-graduate training, our class of fifty men was assigned to complete a month's course in Field Medicine at the Quantico Marine Reservation (thirty miles south of Washington) in Virginia. We returned from this to take the seven months' course at the School. A large number of subjects were given, but the courses in Electrocardiography, Physical Chemistry, and Cadaver Surgery were most valuable. On April 2, 1938, I was assigned to duty in the Dispensary of the Washington Navy Yard (8,000 civilian workers with over 500 sailors and marines). From there, I was ordered to the U. S. S. Melville, a destroyer tender for destroyers of the Battle Force, based at San Diego. Practice in the Navy has been very worthwhile and satisfying, and the introduction to service social life in Washington with several receptions at the White House was most interesting."

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*New York University*
*College of Medicine*

Following a recent meeting of the Council of the University the appointments to the faculty of the College of Medicine of the following members of the staff of the Queens General Hospital were announced. Affiliation between the College of Medicine and the Queens General Hospital was established during the past year. It provides instruction facilities for undergraduate students and for the establishment of postgraduate courses.

Dr. Carl Boettiger, clinical professor of medicine; Dr. Frank R. Mazzola, assistant clinical professor of medicine; Dr. Louis Razinsky, instructor in clinical medicine; Dr. Charles Cramer, assistant in clinical medicine.

Dr. Harry P. Mencken, clinical professor of obstetrics and gynecology; Dr. Moses Cohen, instructor in clinical obstetrics and gynecology; Dr. Joseph Wrana, instructor in clinical obstetrics and gynecology; Dr. Henry H. Lansman, assistant in clinical obstetrics and gynecology; Dr. James V. Rizzi, assistant in clinical obstetrics and gynecology; Dr. Edward C. Veprovsky, assistant in clinical obstetrics and gynecology.

Dr. Walter C. A. Steffen, clinical professor of pediatrics; Dr. Henry A. Reisman, assistant clinical professor of pediatrics; Dr. James M. Dobbins, instructor in clinical pediatrics; Dr. Lester J. Greenberg, Instructor in clinical pediatrics; Dr. Alfred Trivilino, instructor in clinical pediatrics; Dr. Samuel M. Wishik, instructor in clinical pediatrics; Dr. Moe Goldstein, assistant in clinical pediatrics.

Dr. Frank N. Dealy, clinical professor of surgery; Dr. Frederic G. Meynen, assistant clinical professor of surgery; Dr. Harold W. Draffen, instructor in surgery; Dr. James H. Watt, instructor in surgery; Dr. Joseph V. Lanza, assistant in surgery.

New appointment: Dr. Thomas K. Davis, clinical professor of neurology.

Promotions: Dr. Frank C. Combes, from clinical professor to assistant professor of dermatology and syphilology; Dr. Timothy J. Riordan, from instructor to assistant clinical professor of dermatology and syphilology; Dr. Evan W. Thomas, from assistant to assistant clinical professor of dermatology and syphilology.

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*Western Reserve University*
*School of Medicine*

Dr. Carl J. Wiggers, professor of physiology, has returned from a lecture trip to South America. He visited

Callao, Peru; Arica, Valparaiso, Santiago, Chili; Buenos Aires, Argentina. Dr. Wiggers delivered a series of lectures in Spanish on the applications of physiology to medicine.

The National Cancer Institute has chosen this School as one of the centers for training of physicians in the diagnosis and treatment of cancer. Appointments are filled at present, but, as vacancies may arise, those interested should apply promptly to the Surgeon General, U. S. Public Health Service, Washington, D. C. Appointments are for two years, with eight months each of pathology, radiology and surgery. Applicants must have had at least three years of hospital training, one of which may have been a rotating internship; at least two years must have been in surgical experience. Not more than one trainee can be accepted at present, but the number may later be increased to three, according to the announcement. Trainees will be paid by the National Cancer Institute on a per diem basis, out of which they will be expected to pay all the necessary expenses, including tuition, if any is charged by the institution which accepts them for training. Stipends for training will range from a per diem allowance of from $5 to $10, depending on training, experience and other considerations. Further information and application blanks may be obtained on written request to the Surgeon General at Washington or from Dr. John H. Lazzari, Secretary of the Cancer Training at Western Reserve University, Republic Building, Cleveland, Ohio.

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*University of Virginia*
*Department of Medicine*

October 18th, Dr. H. E. Jordan delivered the first lecture in the symposium on blood arranged under the auspices of the Richmond Academy of Medicine. He spoke on the subject of the Histology and Embryology of the Blood.

The new addition for the care of neuropsychiatric patients at the University of Virginia Hospital was begun October 5th. The work is financed in part by the Federal Emergency Administration of Public Works. The total expenditure will be approximately $150,000.

Post graduate courses in internal medicine were given in Wytheville, Virginia, by Dr. J. Edwin Wood, October 27th and by Dr. H. B. Mulholland, November 3rd.

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*Long Island*
*College of Medicine*

Dr. Joshua M. Van Cott, emeritus professor of pathology and clinical medicine, was elected a member of the Board of Trustees of the College at its meeting held on October 31st. A graduate of the Long Island College Hospital in 1885, Doctor Van Cott is also President of the Board of Trustees of the Hoagland Laboratory.

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*University of Cincinnati*
*Children's Hospital*
*Research Foundation*

Announcement is made by Dr. A. Graeme Mitchell, Director of the Children's Hospital Research Foundation, Cincinnati, and Dr. Glenn E. Cullen, Director of Laboratories, that on authorization of the Board of Trustees a Scientific Advisory Council has been appointed. This consists of: Dr. O. T. Avery, member of the Hospital of the Rockefeller Institute for Medical Research; Dr. Ernest Goodpasture, professor of pathology, Vanderbilt university School of Medicine; Dr. A. Baird Hastings, professor of biological chemistry, Harvard University Medical School; Dr. A. N. Richards, professor of pharmacology, University of Pennsylvania School of Medicine.

The Children's Hospital Research Foundation was created in 1929 through the generosity of Mr. William Cooper Procter. Its facilities include its own laboratory building and affiliations with the Children's Hospital of Cincinnati, the Pediatric Department and the Contagious Disease Pavilions of the Cincinnati General Hospital, the Children's

Convalescent Home, the Babies' Milk Fund Association, and the Ohio Soldiers' and Sailors' Orphans' Home at Xenia, Ohio. The Children's Hospital and its Research Foundation are affiliated by agreement with the University of Cincinnati, the Professor of Pediatrics in the University of Cincinnati being the Director of the Medical Service and the Director of the Foundation. Approximately 150 publications have appeared from the Research Foundation. Present plans contemplate additions to the Staff and certain new lines of investigation.

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*University of Cincinnati*
*College of Medicine*

Dr. Joseph A. Freiberg, associate professor, will succeed his father, Dr. Albert H. Freiberg, as head of the department of orthopedic surgery.

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*University of Vermont*
*College of Medicine*

Dr. Harold B. Pierce has been appointed professor and head of the department of biochemistry and acting head of the department of pharmacology. Dr. Clifford S. Leonard has been appointed assistant professor of pharmacology.

The medical library has recently purchased one of the rare copies of the original and first "Pharmacopoeia" published in the United States. It was published in 1808 by the Massachusetts Medical Society in Boston. It is an untrimmed copy of this scarce item in original green paper covered boards and original pink label.

Two copies of books by Sir William Osler have been given to the medical library by Dr. W. W. Francis, librarian of the Osler Medical Library at McGill University. The names of these copies, which are autographed, are "A Way of Life" and "Man's Redemption of Man." Dr. Francis, who was a personal friend of this distinguished scholar of medicine, recently spoke at the University of Vermont medical students' Osler Society.

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*New York Medical College*

Dr. L. Corsan Reid has been promoted to the position of Assistant Professor of Pathology, in charge of Surgical Pathology. Dr. David McCullagh Mayer has been promoted to the position of Assistant Professor of Oral and Plastic Surgery, and Chief of that Service.

A gift of $10,000, provided in the will of Mrs. Sophie Gondron, has been received for the endowment of a room in the Flower-Fifth Avenue Hospital, to be known as "College Alumni Room." The principal of an additional gift of $10,000 is to be used for maintenance of the room.

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*College of Medical Evangelists*

In the Los Angeles Division of the College is a Student-Faculty Association and as part of the organization the students get out a little paper called "The Association Reporter." In it they present almost anything that is legitimate and as a general thing the paper serves a very good function. In the last issue the following item under the column entitled "The Pop Off" is interesting:

"Dear Ed:

"Why in the name of sense are the J.A.M.S. magazines put in our boxes? Of course, I know the magazines are free and all of that, but surely this school can not approve of the jokes printed on the last page—yes I read them.

"Shouldn't we as students go on record as not wishing to have this magazine put in our boxes? Many of the articles are good, but the editorial tone of the paper is poor.

"I would like to read a discussion of this topic."

Your truly,"

# General News

*Hormel Research Foundation*

An annual grant of $25,000 has been given to the University of Minnesota by George A. Hormel and Company, Austin, to establish the Hormel Research Foundation for the promotion of researches in the field of food technology. According to *Science,* most of the research will be devoted to problems of importance to the packing industry. The work will be carried on by a committee consisting of George O. Burr, Ph.D., Ross A. Gortner, Ph.D., Halvor O. Halvorson, Ph.D., Walter M. Lauer, Ph.D., and Samuel C. Lind, Ph.D. Dr. Lind is chairman.

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*Philadelphia Postgraduate Institute*

The Philadelphia County Medical Society announces the Fourth Annual Postgraduate Institute to be held in the Bellevue-Stratford Hotel, Philadelphia, during the week beginning March 13th, 1939. The subjects to be considered are those embraced by the terms Blood Dyscrasias and Metabolic Disorders. These will be further subdivided for convenience in instruction into eighty-six clinical lectures, with open forum discussion for each topic, delivered by as many individual specialists of national distinction.

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*Mary Putnam Jacobi Fellowship*

The Women's Medical Association of the City of New York offers the Mary Putnam Jacobi Fellowship, of $1,000 for one year; available for postgraduate work in the medical sciences.

The fellowship is open to any woman graduate of an approved medical school. Each candidate must be endorsed by the head of the department in which her previous work has been done. The recipient of the fellowship must give full time to the study of her problem and this study should be made preferably abroad.

The recipient of the fellowship, if not resident in the United States, should make the study preferably in the United States.

Applications for 1939-40 should be filed with the chairman of the committee on or before April 1, 1939, and must be accompanied by statements as to health, educational qualifications, proposed problem for investigation, and a photograph of the applicant.

A report for publication will be required at the completion of the fellowship. Applications should be sent to Dr. Annie S. Daniel, chairman, 321 East 15th Street, New York, N. Y.

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*Clay-Adams Company*

Due to the pressure of enlarged business and in keeping with their need for greater facilities which will serve their accounts better, the Clay-Adams Company has moved to new and much bigger quarters at 44 East 23rd Street, New York City.

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*American Board of Ophthalmology*

The American Board of Ophthalmology announces an important change in its method of examination of candidates for the Board's certificate.

Examinations will be divided into two parts. Candidates whose applications are accepted will be required to pass a written examination which will be held simultaneously in various cities throughout the country approximately 60 days prior to the date of the oral examination.

The written examination will include all of the subjects previously covered by the practical and oral examinations.

Oral examinations will be held at

time and place of the meeting of the American Medical Association and of the American Academy of Ophthalmology and Oto-Laryngology, and occasionally in connection with other important medical meetings. The oral examination will be on the following subjects: External Diseases, Ophthalmoscopy, Pathology, Refraction, Ocular Motility, Practical Surgery.

Only those candidates who pass the written examination and who have presented satisfactory case reports will be permitted to appear for the oral examination.

Examinations scheduled for 1939: Written: March 15th and August 5th. Oral: St. Louis, May 15th; Chicago, October 6th.

Applications for permission to take the written examination March 15th must be filed with the Secretary not later than February 15th.

Application forms and detailed information should be secured at once from Dr. John Green, Secretary, 6830 Waterman Ave., St. Louis, Mo.

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### *Medical Research Facilities in Canada to Be Surveyed*

A survey of the facilities for medical research in Canada is to be made under the auspices of the Associate Committee on Medical Research established last March by the National Research Council. Sir Frederick Banting, discoverer of insulin, will be in charge and will visit each of the principal centers throughout Canada to learn at first hand of the work that is in progress.

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### *West Virginia Requires Citizenship*

The West Virginia Public Health Council recently adopted a resolution limiting the license to practice medicine and surgery in the state to native-born citizens and those who have acquired full citizenship. Each native-born citizen is to submit a birth certificate, and each foreign born applicant a photostatic copy of his naturalization papers. At the same meeting the council adopted a resolution declaring that graduates of unclassified medical schools will not henceforth be considered for licensure either by examination or by reciprocity.

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### *Colorado Requires National Board Examinations*

In view of the increasing difficulties of investigating the standard of medical colleges located outside the United States, its territories, and insular possessions, the Colorado State Board of Medical Examiners will require that foreign trained applicants for a medical license must first be examined and certified by the National Board of Medical Examiners.

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### *Prize for Encephalitis Research*

The University of Bern, Switzerland, directs attention to the prize of 1,000 Swiss francs offered each year for work on lethargic encephalitis that signifies real progress in the diagnosis or treatment of the disease. Those who wish to participate in the competition should send their application to the dean of the Medical Faculty, University of Bern.

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### *University of California Medical School*

During the period, December 14th to December 17th, 1938, the University of California Medical School gave an intensive post graduate course on the treatment of fractures. Over forty practicing physicians from California and other western states were enrolled. The course, which was given by members of the staff of the Division of Orthopedic Surgery and some members of other divisions, was designed to meet the needs of physicians engaged in private practice. Through clinical presentations, detailed outlines of treatment and demonstrations, effort was made to make the course applicable to the problems encountered in practice.

# Book News

*Doctor Bradley Remembers*

By Francis Brett Young. Reynal & Hitchcock, Inc., New York City. 1938. Price, $2.75.

The physician-author has written a book which physicians will enjoy reading. Unlike the usual book about physicians, this one is real and true. The unreeling of the reveries of Dr. Bradley will bring to the mind of the physician reader many incidents of his own life; his struggles; his moments of elation; his moments of depression. It is all so real, so alive, so true. The old doctor, after fifty years of general practice in a small community, has decided to retire. He has not amassed wealth, but the memories growing out of a busy life, of many hours spent with patients who he knows will pay only in gratitude, rise up vividly as Dr. Bradley sits by his fireside, drinks his wine, smokes his pipe — and dreams. It is his last night in his surgery. He has scolded his last patient, written *paid* to his last account. After half a century of loving service and benign untruths he sits back for a minute—to dream of his long, rich life. As he muses, the past comes vividly alive. His was no sudden rise to riches and fame. No honors were showered upon him, yet the story of his fifty years of service to mankind is crammed to bursting with the very stuff of reality.

The time is the 1880's, when Lister and Pasteur were bold adventurers, and a 58 per cent mortality from operations was considered inevitable. Into this medical world of dispute and controversy comes young John Bradley.

As his own career takes shape, the novel develops a wide experience of humanity. For in and out of Dr. Bradley's office come people whose lives are touched by tragedy and death, love and joy—all the human emotions of which a doctor sees more than any other servant of mankind.

Physicians will enjoy this book thoroughly. It is far more fascinating than a detective story.

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*Marihuana: America's New Drug Problem*

A Sociologic Question with its Basic Explanation Dependent on Biologic and Medical Principles. By Robert D. Walton, Professor of Pharmacology, School of Medicine, University of Mississippi. With a Foreword by E. M. K. Geiling, Professor of Pharmacology, University of Chicago, and a Chapter by Frank K. Gomila, Commissioner of Public Safety, New Orleans, and M. C. Gomila Lambou, Assistant City Chemist. J. B. Lippincott Company, Philadelphia. 1938. Price, $3.

Dr. Walton presents the main substance of the vast material on marihuana which he has collected and edited. The book is intended primarily as a reference source for those seeking information on the particular features of this drug practice. The collection of the material was begun as a research project in the Department of Pharmacology of the University of Chicago. The information on marihuana contained in this book is complete. The bibliography is extensive. The book should appeal particularly to parents, boards of education, teachers in high schools and colleges, attorneys and judges, police officers, physicians and nurses, pharmacologists, welfare workers and public health groups, ministers and many others. This alarming problem can and will be solved only when an enlightened public, informed of marihuana's shocking dangers and aroused to intelligent action, will stamp out this evil. The book has equal value for the layman and the physician.

*Intern's Handbook*

A guide, especially in emergencies, for the intern and the physician in general practice. By members of the faculty of the College of Medicine, Syracuse University. Under the Direction of M. S. Dooley, M. D. 2nd Ed. Revised and reset. J. B. Lippincott Company, Philadelphia. 1938. Price, $3.

This is a valuable book, one which should have a prominent place in the intern's armamentarium and which also will be very helpful to the practitioner. It is compact, concise, strictly up-to-date and a veritable encyclopedia of worthwhile information on when to do, what to do, how to do in almost any emergency.

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*Medicine in the Outpatient Department*

By Winthrop Wetherbee, Jr., M. D. Junior Visiting Physician Boston City Hospital. With a Foreword by Dr. George R. Minot. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York City. 1938. Price, $1.

The basis of this book is a paper published by the author in the Journal of the Association of American Medical Colleges which met with the unqualified approval of medical teachers. Every student on service in an outpatient department should carry a copy of this valuable guide for action in his pocket —when he is not reading it. It is clear, concise, very readable and full of words of wisdom.

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*Principles and Practice of Perimetry*

By Luther C. Peter, M. D. Professor of Ophthalmology in the Graduate School of Medicine of the University of Pennsylvania. 4th Ed. Lea & Febiger, Philadelphia. 1938. Price, $4.50.

The new edition of this work is an elaboration of the course in perimetry which the author presents in the Graduate School of the University of Pennsylvania. It is here amplified to meet the needs of ophthalmologists and practitioners in allied branches of medicine. Every effort has been made to present the various phases of perimetry in logical sequence. Thus the book opens with a summary of the anatomy and physiology of the visual pathway and leads naturally to a discussion of methods of study, instrumentation and technique. A study of the character and variations of normal fields paves the way to the recognition of digressions from the normal. Under special pathology the characteristic changes are discussed in order from diseases of the retina, choroid and nerve head through the visual pathways to the cortical or higher visual centers of the brain.

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*Your Chest Should Be Flat*

The Deep Chest Makes Better Soil for Tuberculosis. By S. A. Weisman, M.D., Assistant Professor of Medicine University of Minnesota. J. B. Lippincott Company, Philadelphia. 1938. Price, $2.

In this study the author presents evidence along several lines pointing to the conclusion that the deep, narrow chest is more susceptible to tuberculosis than is the normal, flat chest. The large group of persons who are engaged in the training of children and young people as well as teachers, social workers, physical education directors, parents and physicians will find in this book a contribution, not available elsewhere, that will aid in the ceaseless struggle for the prevention and ultimate elimination of one of man's most insidious and destructive foes—tuberculosis.

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*"Tell Me the Truth, Doctor"*

By Irwin I. Lubowe, M.D., with an introduction by Admiral Charles S. Butler, Admiral (M.C.) U. S. Navy. Dorrance & Company, Philadelphia. 1938. Price, $1.50.

A frank, revealing and educational discussion of venereal diseases and sex hygiene, conducted in the privacy of the physician's consulting room.